DOCUMENT RESUME

ED 225 570 IR 050 050

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TITLE A Practical Introduction to Non-Bibliographic Database Searching.
INSTITUTION California Univ., Davis. Univ. Library.
PUB DATE 82
NOTE 120p.; Papers originally presented to the Davis Online Reference Services Group (Davis, CA, 1981). Project funded by a research grant from the Librarians Association of the University of California.
PUB TYPE Collected Works - General (020) -- Guides - General (050) -- Reports - Descriptive (141)

EDRS PRICE MF01/PC05 Plus Postage.
DESCRIPTORS Business; *Databases; Economics; Industry; *Information Retrieval; Laboratory Animals; *Online Systems; Poisons; Reference Services; *Search Strategies; Statistics; Toxicology
IDENTIFIERS Chemicals; *Nonbibliographic Databases

ABSTRACT

This guide comprises four reports on the Laboratory Animal Data Bank (LADB), the National Institute of Health Environmental Protection Agency (NIH/EPA) Chemical Information System (CIS), nonbibliographic databases for the social sciences, and the Toxicology Data Bank (TDB) and Registry of Toxic Effects of Chemical Substances (RTECS). The first report describes LADB, which is designed to provide animal scientists with information on different species and strains of laboratory animals. Four annotated search examples demonstrate particular LADB features in the recall or manipulation of data. The second paper examines major files available on the NIH/EPA CIS system, which is used to identify chemical compounds and obtain information on their toxic effects. Explanations of system commands, specific search examples, and a complete list of CIS files are provided. Focusing on nonbibliographic databases which provide business, industrial, and economic information, the third report discusses Disclosure, the Economic Information Systems (EIC) files, and the Predicasts Terminal System (PTS) family of statistical databases. Two search examples are given for each file group. The final paper compares TDB and RTECS, both of which provide chemical toxicity data. Examples of a chemical unit record and three sample searches are presented for each of the two databases. (ESR)

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A PRACTICAL INTRODUCTION TO

NON-BIBLIOGRAPHIC DATABASE SEARCHING

University of California
Davis
1982

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This project was funded by a research grant from the Librarians Association of the University of California. The papers were originally presented in 1981 to the Davis Online Reference Services Group as part of a Continuing Education Program.

LADB - Source of Unpublished Data

Hans J. Rocke
Shields Library
University of California, Davis

L A D B - Source of Unpublished Data

OUTLINE

LABORATORY ANIMAL DATA BANK

Purpose:	Baseline and reference information
Coverage:	Animals, tests, and conditions
Access:	TYMNET
Search Protocol:	Structured and Direct
Data Manipulation:	Statistical packages

ANNOTATED SEARCH EXAMPLES

1. Producing a hematology report for Long-Evans rats

2. Comparing the calcium levels of Rhesus monkeys on different feed; one of the negative control groups received WAYNE CHOW while the other received PURINA MONKEY CHOW.

3. Graphing the data for body weight of Beagle dogs by age in a scatterplot.

4. Preparing a pathology report showing growth alterations of the lymphoid system in female dogs.

Each search example demonstrates a particular feature of LADB to recall or to manipulate the data:

1. Complete list of hematological data

2. Comparison of electrolyte levels for different feeds.

3. Statistical processing and graphic representation.

4. Compilation of pathology data by age and organ system.

LABORATORY ANIMAL DATA BANK

The Laboratory Animal Data Bank (LADB) is an online system designed to provide animal scientists with comparative baseline and reference information for different species and strains of laboratory animals. Under the administration of the Battelle Columbus Laboratories, the LADB maintains data from private and non-profit research laboratories, pharmaceutical companies, animal breeders, and laboratories of universities, industry, and the government (58 regular and 43 committed participants in 1980).

The information covers about eight different types of control animals, reporting on clinical chemistry, hematology, pathology, body and organ weight and food and water consumption. The data are further categorized by environment or husbandry factors, such as the type of housing, the food and supplier; by test methods, by physiological characteristics and by breeding and genetics.

In September 1980, LADB contained more than 900,000 observations. These observations were screened by an internal biomedical data review committee and stored in one of three files:

1. The Individual Animal Data File
2. The Baseline File
3. The Animal Reference File

LADB can be accessed both online and offline. Online the LADB is publicly available via the TYMNET communication system or direct dial for interactive searching on a terminal. Search results can be printed at the time of the search or requested offline. LADB also accepts requests for custom searches. The system offers user assistance in the form of user manuals and hot-line service.

For the infrequent user, LADB provides a structured search mode. It prompts the user to choose from menus progressing along the programmed search strategy toward the desired answer. Once the searcher has more experience, an abbreviated mode of the structured search can be selected at the start of the search.

For the experienced searcher, the direct search is a time-saving way to arrive at search results with a command-oriented mode. Once the data have been obtained, LADB offers statistical analysis to apply the T-test or analysis of variance, or to display the data in the form of distributions, cross tabulations, breakdowns, or scatterplots. It also allows the biomedical researcher to obtain and to manipulate clinical baseline data on animals for various purposes. LADB contains data on control animals to establish animal models or to determine the effects of environment or husbandry factors. LADB allows the comparison of baseline values for different test methods, animal strains, or animal groups as well as checking the different test techniques for validity and consistency. Furthermore, LADB provides the data to examine the frequency of spontaneous disease conditions or to track strain drift.

In order to continue the development and improvement of the database, LADB solicited user feedback via questionnaires and user comments at the end of every search. Unfortunately, lack of funding prevents LADB's availability beyond 15 February 1982. Only with the support and upon the demand of the scientific community can this service be reactivated.

The published literature may be replete with articles reporting on biological experiments but usually the articles provide insufficient information about the species, source, age, sex, husbandry, nutrition, and environment of the animals, thus making it impossible to replicate the experiment. For this reason even the most extensive literature search would not provide this information which can be found only in the Laboratory Animal Data Bank.

The SEARCH EXAMPLES consist of a Strategy Outline and a reproduction of the online search produced on LADB. The Strategy Outline is a summary of the menus used in the LADB search process showing the purpose of the menu in the second column and the required selection from the menu in the third column. E. g., in Menu 007 where the type of animal is chosen, the selection is for number 8, the rat.

Literature

Crampon, Jean E. "Introducing the Laboratory Animal Data Bank." DATA-BASE 4 (3):12-28 September 1981

SEARCH EXAMPLE 1
Hematology of Long-Evans Rats

Strategy Outline		
Menu 007	Type of animal	8. Rat
Menu 010	Type of rat	4. Long-Evans
Menu 011	Next Step	1. Proceed to Reporting
Menu 019	Reporting Feature	5. Hematology

10-NOV-1981 12:29:40

WELCOME TO THE
LABORATORY ANIMAL DATA BANK (LADB)
SPONSORED BY THE
NATIONAL LIBRARY OF MEDICINE
AND DHHS COMMITTEE TO COORDINATE ENVIRONMENTAL AND RELATED PROGRAMS.

FOR INFORMATION, ON-LINE ASSISTANCE OR OFF-LINE SEARCH REQUESTS,
CALL THE LADB HOTLINE (703) 790-8080.

NOTICE 1/19/81
LADB IS NOW OPERATING ON A VAX 11/780 COMPUTER. PLEASE REFER TO
YOUR RECENTLY RECEIVED NOTICE FOR DIFFERENCES IN BACKSPACE AND
INTERRUPT PROCEDURES

LADB SEARCH - VERSION 4.6

001. CHOOSE LADB SEARCH MODE BY NUMBER:
1. STRUCTURED (MENU ORIENTED)
2. DIRECT (COMMAND ORIENTED)
/ 1

002. IN WHICH MANNER WOULD YOU LIKE YOUR MENUS TO BE PRINTED?
1. STANDARD LEVEL (FULL MENU PRINTED EACH TIME)
2. EXPERT LEVEL (CERTAIN MENUS ARE ABBREVIATED.)
(FULL MENU CAN BE REQUESTED BY ENTERING ?)
/ 2

003. CHOOSE LADB SERVICE:
/ ?

003. CHOOSE LADB SERVICE:
1. START A SEARCH (SELECT ANIMAL GROUPS FROM LADB)

```
  2. EXAMINE THE TABLE OF CONTENTS
  3. ENTER COMMENTS/REMARKS
   / 1

007. CHOOSE ONE TYPE OF ANIMAL:
  / ?

007. CHOOSE ONE TYPE OF ANIMAL:
  1. CAT (DOMESTIC SHORT HAIR ONLY)
  2. DOG
  3. GUINEA PIG
  4. MINIPIG
  5. MONKEY
  6. MOUSE
  7. RABBIT (NEW ZEALAND WHITE)
  8. RAT
  9. TREE SHREW (TUPAIA)

   / 8

010. CHOOSE TYPE(S) OF RAT:

   / ?

010. CHOOSE TYPE(S) OF RAT:
  1. ALL
  2. FISCHER 344
  3. HARLAN WISTAR
  4. LONG-EVANS
  5. OSBORNE MENDEL
  6. SHERMAN
  7. SPRAGUE DAWLEY
  8. WISTAR
   / 4

THERE ARE 16  ANIMAL GROUPS FOR YOUR SEARCH

011. FOR THESE ANIMAL GROUPS, CHOOSE YOUR NEXT STEP:
   / ?

011. FOR THESE ANIMAL GROUPS, CHOOSE YOUR NEXT STEP:
  1. PROCEED TO REPORTING WITHOUT FURTHER REFINEMENT
  2. REFINE YOUR SEARCH BY SELECTING BY ENVIRONMENT
     OR HUSBANDRY FACTORS
   / 1

019. CHOOSE ONE REPORTING FEATURE:
  1. ENVIRONMENT/HUSBANDRY
  2. PATHOLOGY
  3. ORGANS EXAMINED
  4. CLINICAL CHEMISTRY
```

```
  5. HEMATOLOGY
  6. TEST METHODS
  7. BODY WEIGHT AND FOOD/WATER CONSUMPTION
  8. ORGAN WEIGHT
  9. STATISTICAL ANALYSIS
   / 5

THERE ARE 7    ANIMAL GROUPS REMAINING IN YOUR SEARCH

DO YOU WANT TO LIMIT YOUR DATA BY AGE, SEX, OR TEST YEAR?
   / NO

PLEASE WAIT WHILE LADB PREPARES YOUR REPORT

LADB HEMATOLOGY REPORT 26-JAN-1981 16:42:17

CHOOSE REPORTING OPTION:
  1. SEPARATE REPORT FOR EACH ANIMAL GROUP
  2. SINGLE REPORT FOR ALL ANIMAL GROUPS COMBINED
  3. BOTH
   / 2

PRINT OFF-LINE?
   / NO

THERE WILL BE A BRIEF DELAY WHILE DATA FOR ALL SELECTED ANIMAL
GROUPS ARE BEING RETRIEVED AND COMBINED FOR YOUR REPORT.
THANK YOU FOR WAITING.

ALL ANIMAL GROUPS COMBINED
```

DATA ELEMENT	N	AVERAGE	STD.DEV.	UNITS
HEMATOCRIT	193	39.0976	4.5530	%
HEMOGLOBIN	193	13.6792	1.5650	G/DL
RBC	195	7.0723	1.0192	NUMBER*10**6/UL
NRBC	123	0.2043	0.6015	PER 100 RBC
WBC	195	5.2775	3.6439	NUMBER*1000/UL
DIFF. (NONSEGS) NEUTROPHILS	195	0.0151	0.1036	NUMBER*1000/UL
DIFF. (SEG) NEUTROPHILS	195	2.2036	2.6143	NUMBER*1000/UL
DIFF. (LYMPHOCYTES)	195	2.9201	1.7290	NUMBER*1000/UL
DIFF. (MONOCYTES)	195	0.0083	0.0345	NUMBER*1000/UL
DIFF. (EOSINOPHILS)	195	0.0813	0.0804	NUMBER*1000/UL
DIFF. (BASOPHILS)	195	0.0003	0.0044	NUMBER*1000/UL
MCH	176	19.3554	1.3182	PG
MCHC	176	35.1053	1.1163	G/DL
MCV	176	54.5899	3.0251	FL

```
END OF REPORT
```

SEARCH EXAMPLE 2
Comparison of Electrolytes in Two Feeds

Strategy Outline		
Menu 007	Type of animal	5. Monkey
Menu 008	Type of monkey	6. Rhesus
	Refine the search	2. Refine
Menu 014	Environment/Husbandry	1. Control and Microbial Status
Menu 044	Item of interest	2. Type of control used
Menu 012	Type of Control	2. Negative Controls
Menu 011	Next Step	2. Refine by E/H
Menu 014	E/H	13. Feed
Menu 044	Item of interest	1. Feed Commercial Brand
Menu 012	Feed Commercial Brands	2. List
	Available Selections	3. PURINA MONKEY CHOW
Menu 011	Next Step	1. Report
Menu 019	Reporting Feature	2. Clinical Chemistry
	Reporting Option	2. Single Report

NOTE

The calcium level for negative control Rhesus on PURINA MONKEY CHOW is 5.1620 +/- 0.4260 MEQ/L. Repeat the previous steps, except under Menu 012 the available selection is for 5. WAYNE CHOW. The clinical chemistry of these monkeys shows the calcium level at 4.8820 +/-0.3307 MEQ/L. The standard deviation of the results for the two commercial brands is so large that there is no significant difference in the calcium levels and the two brands could be fed to experimental animals interchangeably.

Comparison of Calcium Levels for Negative Control Rhesus Monkeys on WAYNE CHOW vs. PURINA MONKEY CHOW Diets

036. CHOOSE YOUR NEXT STEP:
1. PRODUCE ANOTHER REPORT
2. PRODUCE A DIFFERENT TYPE OF REPORT (MENU 019)
3. REFINE YOU SEARCH BY SELECTING E/H FACTORS (MENU 014)
4. START OVER (MENU 003)
5. STOP LADB
/ 4

003. CHOOSE LADB SERVICE:
1. START A SEARCH (SELECT ANIMAL GROUP FROM LADB)
2. EXAMINE THE TABLE OF CONTENTS
3. ENTER COMMENTS/REMARKS
/ 1

007. CHOOSE ONE TYPE OF ANIMAL:
/ 5

008. CHOOSE TYPE(S) OF MONKEYS:
1. ALL
2. CINNAMON RINGTAIL
3. COTTONTOP PINCHE
4. CYNOMOLGUS
5. PATAS
6. RHESUS
7. SQUIRREL
8. STUMP-TAILED
/ 6

THERE ARE 24 ANIMAL GROUPS FOR YOUR SEARCH

011. FOR THESE ANIMAL GROUPS, CHOOSE YOUR NEXT STEP:
1. PROCEED TO REPORTING WITHOUT FURTHER REFINEMENT
2. REFINE YOUR SEARCH BY SELECTING BY ENVIRONMENT/HUSBANDRY FACTORS
/ 2

014. CHOOSE ENVIRONMENT/HUSBANDRY FACTOR(S):
/ ?

014. CHOOSE ENVIRONMENT/HUSBANDRY FACTORS

1. CONTROL & MICROBIAL STATUS	10. ANIMAL HOUSING
2. DATA SOURCE	11. CONDITIONING
3. DATA SOURCE LOCATION	12. BEDDING
4. SUPPLIER	13. FEED

```
  5. REPRODUCTION                    14. WATER SUPPLY
  6. HOUSING LIGHTING                15. STERILIZATION
  7. HOUSING TEMPERATURE             16. ANIMAL GROUP SIZE
  8. HOUSING RELATIVE HUMIDITY
  9. HOUSING VENTILATION             17. ENTER INDIVIDUAL E/H DATA
                                         ELEMENT ABBREVIATION(S)
  / 1

044. CHOOSE CONTROL AND MICROBIAL STATUS ITEMS OF INTEREST:
  1. MICROBIAL STATUS
  2. TYPE OF CONTROL USED
  3. SHAM OR VEHICLE ADMINISTERED
    / 2

THERE ARE 24   ANIMAL GROUPS REMAINING IN YOUR SEARCH

012. FOR TYPE OF CONTROL USED
CHOOSE 1. FIND, 2. LIST, 3. STOP:
    / 2

AVAILABLE SELECTIONS FOR TYPE OF CONTROL USED:
  1. ALL
  2. CONT=NEGATIVE CONTROLS (  19  )
  3. CONT=VEHICLE CONTROLS (  5  )

SELECT ITEMS OF INTEREST:
    / 2

THERE ARE   19 ANIMAL GROUPS REMAINING IN YOUR SEARCH

011. FOR THESE ANIMAL GROUPS, CHOOSE YOUR NEXT STEP:
    / 2

014. CHOOSE ENVIRONMENT/HUSBANDRY FACTOR(S):
    / 1

044. CHOOSE FEED ITEMS OF INTEREST:
  1. FEED COMMERCIAL BRAND
  2. FEED MANUFACTURER OR SUPPLIER
  3. FEED CRUDE PROTEIN
  4. FEED CRUDE FAT
  5. BASAL DIET SUPPLEMENTED
  6. SUPPLEMENT FREQUENCY
  7. SUPPLEMENT INGREDIENTS
  8. FEEDING FREQUENCY
  9. FEED METHOD
 10. DAILY FEED PORTION
 11. FEED TREATMENT BEFORE FEEDING
 12. FEED FORM
 13. FEED CONTAINER
    / 1
```

```
THERE ARE 19  ANIMAL GROUPS REMAINING IN YOUR SEARCH

012. FOR FEED COMMERCIAL BRAND
CHOOSE 1. FIND, 2. LIST, 3. STOP:
    / 2

AVAILABLE SELECTIONS FOR FEED COMMERCIAL BRANDS:
  1. ALL
  2. FCB=HIGH PROTEIN MONKEY CHOW 5045  (    1 )
  3. FCB=PURINA MONKEY CHOW (   11 )
  4. FCB=PURINA MONKEY CHOW 5038 (   1 )
  5. FCB=WAYNE CHOW (  6 )

SELECT ITEM(S) OF INTEREST:
    / 3

THERE ARE 11  ANIMAL GROUPS REMAINING IN YOUR SEARCH

011. FOR THESE ANIMAL GROUPS, CHOOSE YOUR NEXT STEP:
    / 1

019. CHOOSE ONE REPORTING FEATURE:
  1. ENVIRONMENT/HUSBANDRY
  2. CLINICAL CHEMISTRY
  3. HEMATOLOGY
  4. TEST METHODS
  5. BODY WEIGHT AND FOOD/WATER CONSUMPTION
  6. STATISTICAL ANALYSIS
    / 2

THERE ARE 11 ANIMAL GROUPS REMAINING IN YOUR SEARCH

DO YOU WANT TO LIMIT YOUR DATA BY AGE, SEX, OR TEST YEAR?
    / NO

PLEASE WAIT WHILE LADB PREPARES YOUR REPORT



LADB CLINICAL CHEMISTRY REPORT 27-JAN-1981 18:08:31

CHOOSE REPORTING OPTION:
  1. SEPARATE REPORT FOR EACH ANIMAL GROUP
  2. SINGLE REPORT FOR ALL ANIMAL GROUPS COMBINED
  3. BOTH
    / 2

PRINT OFF-LINE?
    / NO
```

THERE WILL BE A BRIEF DELAY WHILE DATA FOR ALL SELECTED ANIMAL GROUPS ARE BEING RETRIEVED AND COMBINED FOR YOUR REPORT.
THANK YOU FOR WAITING.

ALL ANIMAL GROUPS COMBINED

DATA ELEMENT	N	AVERAGE	STD.DEV.	UNITS
CHLORIDE	822	107.2371	5.3829	MEQ/L
SODIUM	947	151.3973	6.8007	MEQ/L
POTASSIUM	948	4.6072	0.7748	MEQ/L
CALCIUM	789	5.1620	0.4260	MEQ/L
MAGNESIUM	787	1.5768	0.2110	MEQ/L
ALBUMIN	166	3.6504	0.5919	G/DL
TOTAL PROTEIN	330	6.8972	0.6094	G/DL
BILIRUBIN DIRECT	385	0.1139	0.1373	MG/DL
BILIRUBIN TOTAL	687	0.1935	0.1895	MG/DL
BSP15	765	14.5689	9.3228	% RETENTION AT 15
PROTHROMBIN TIME	443	11.0313	2.0313	SEC
BUN	932	17.0055	4.5928	MG/DL
CREATININE	788	1.0714	0.2841	MG/DL
ALKALINE PHOSPHATASE	801	295.0795	157.5877	I.U./L
LDH	41	152.2337	71.9016	I.U./L
SGOT	820	31.0374	14.6565	I.U./L
SGPT	746	26.4052	12.4653	I.U./L
SGPT	84	24.1951	12.9046	SIGMA FRANKEL
GLUCOSE	942	102.6051	30.6990	MG/DL

END OF REPORT

036. FOLLOWING CLINICAL CHEMISTRY REPORT, CHOOSE YOUR NEXT STEP:
/ 4

003. CHOOSE LADB SERVICE:
/ 1

007. CHOOSE ONE TYPE OF ANIMAL:
/ 5

008. CHOOSE TYPE(S) OF MONKEY:
/ 6

THERE ARE 24 ANIMAL GROUPS FOR YOUR SEARCH

011. FOR THESE ANIMAL GROUPS, CHOOSE YOUR NEXT STEP:
/ 2

014. CHOOSE ENVIRONMENT/HUSBANDRY FACTOR(S):
/ 1

```
044. CHOOSE CONTROL AND MICROBIAL STATUS ITEMS OF INTEREST:
  1. MICROBIAL STATUS
  2. TYPE OF CONTROL USED
  3. SHAM OR VEHICLE ADMINISTERED
    / 2

THERE ARE 24 ANIMAL GROUPS REMAINING IN YOUR SEARCH

012. FOR TYPE OF CONTROL USED
CHOOSE 1. FIND, 2. LIST, 3. STOP
   / 2

AVAILABLE SELECTIONS FOR TYPE OF CONTROL USED:
  1. ALL
  2. CONT=NEGATIVE CONTROLS (   19 )
  3. CONT=VEHICLE CONTROLS (   5 )

SELECT ITEM(S) OF INTEREST:
    / 2

THERE ARE  19   ANIMAL GROUPS REMAINING IN YOUR SEARCH

011. FOR THESE ANIMAL GROUPS, CHOOSE YOUR NEXT STEP:
     / 2

014. CHOOSE ENVIRONMENT/HUSBANDRY FACTOR(S):
    / 13

044. CHOOSE FEED ITEMS OF INTEREST:
  1. FEED COMMERCIAL BRAND
  2. FEED MANUFACTURER OR SUPPLIER
  3. FEED CRUDE PROTEIN
  4. FEED CRUDE FAT
  5. BASAL DIET SUPPLEMENTED
  6. SUPPLEMENT FREQUENCY
  7. SUPPLEMENT INGREDIENTS
  8. FEEDING FREQUENCY
  9. FEED METHOD
 10. DAILY FEED PORTION
 11. FEED TREATMENT BEFORE FEEDING
 12. FEED FORM
 13. FEED CONTAINER
    / 1

THERE ARE 19  ANIMAL GROUPS REMAINING IN YOUR SEARCH

012. FOR FEED COMMERCIAL BRAND
CHOOSE 1. FIND, 2. LIST, 3. STOP
    / 2
```

```
AVAILABLE SELECTIONS FOR FEED COMMERCIAL BRAND:
  1. ALL
  2. FCB=HIGH PROTEIN MONKEY CHOW 5045 (     1 )
  3. FCB=PURINA MONKEY CHOW (    11 )
  4. FCB=PURINA MONKEY CHOW 5038 (     1 )
  5. FCB=WAYNE CHOW (     6 )

SELECT ITEM(S) OF INTEREST:
    / 5

THERE ARE 6   ANIMAL GROUPS REMAINING IN YOUR SEARCH

011. FOR THESE ANIMAL GROUPS, CHOOSE YOUR NEXT STEP:
    / 1

019. CHOOSE ONE REPORTING FEATURE:
  1. ENVIRONMENT/HUSBANDRY
  2. CLINICAL CHEMISTRY
  3. HEMATOLOGY
  4. TEST METHODS
  5. BODY WEIGHT AND FOOD/WATER CONSUMPTION
  6. STATISTICAL ANALYSIS
    / 2

THERE ARE 6   ANIMAL GROUPS REMAINING IN YOUR SEARCH

DO YOU WANT TO LIMIT YOUR DATA BY AGE, SEX, OR TEST YEAR?
    / NO

PLEASE WAIT WHILE LADB PREPARES YOUR REPORT


LADB CLINICAL CHEMISTRY REPORT 27-JAN-1981 18:13:35

CHOOSE REPORTING OPTION:
  1. SEPARATE REPORT FOR EACH ANIMAL GROUP
  2. SINGLE REPORT FOR ALL ANIMAL GROUPS COMBINED
  3. BOTH
    / 2

PRINT OFF-LINE?
    / NO

THERE WILL BE A BRIEF DELAY WHILE DATA FOR ALL SELECTED ANIMAL
GROUPS ARE BEING RETRIEVED AND COMBINED FOR YOUR REPORT.
THANK YOU FOR WAITING.
```

ALL ANIMAL GROUPS COMBINED

DATA ELEMENT	N	AVERAGE	STD.DEV.	UNITS
CHLORIDE	177	103.0760	3.2890	MEQ/L
SODIUM	177	148.0923	4.1149	MEQ/L
POTASSIUM	177	4.0707	0.5598	MEQ/L
CALCIUM	177	4.8820	0.3307	MEQ/L
MAGNESIUM	177	1.6546	0.3006	MEQ/L
BILIRUBIN DIRECT	19	0.0159	0.0377	MG/DL
BILIRUBIN TOTAL	171	0.1552	0.0682	MG/DL
BSP15	123	16.3706	10.5742	% RETENTION AT 15
BSP30	51	13.0178	8.6151	% RETENTION AT 30
PROTHROMBIN TIME	124	13.7288	2.2253	SEC
BUN	177	14.9642	3.2603	MG/DL
CREATININE	176	1.1690	0.2453	MG/DL
ALKALINE PHOSPHATASE	177	170.9203	66.5019	I.U./L
SGOT	177	29.7279	16.2011	I.U./L
SGPT	124	20.0786	10.6415	I.U./L
SGPT	51	21.3705	9.2467	SIGMA FRANKEL
GLUCOSE	177	112.6806	28.4758	MG/DL

END OF REPORT

SEARCH EXAMPLE 3
Scatterplot of Body Weight and Age of Beagle Dogs

Strategy Outline

Menu 007	Type of Animal	2. Dog
Menu 050	Type of Dog	3. Beagle
Menu 011		1. Report
Menu 016	Reporting Feature	6. Statistical Analysis
Menu 023	Statistical Service	6. Scatterplot
	Independent Variable	1. Age Category
	Dependent Variable	Body Weight

Graphing the Data for Body Weight of Beagle Dogs by Age in a Scatterplot.

036. FOLLOWING CLINICAL CHEMISTRY REPORT, CHOOSE YOUR NEXT STEP:
/ 4

003. CHOOSE LADB SERVICE:
/ 1

007. CHOOSE ONE TYPE OF ANIMAL:
/ 2

050. CHOOSE TYPE(S) OF DOG:
/ 3

THERE ARE 3 ANIMAL GROUPS FOR YOUR SEARCH

011. FOR THESE ANIMAL GROUPS, CHOOSE YOUR NEXT STEP:
/ 1

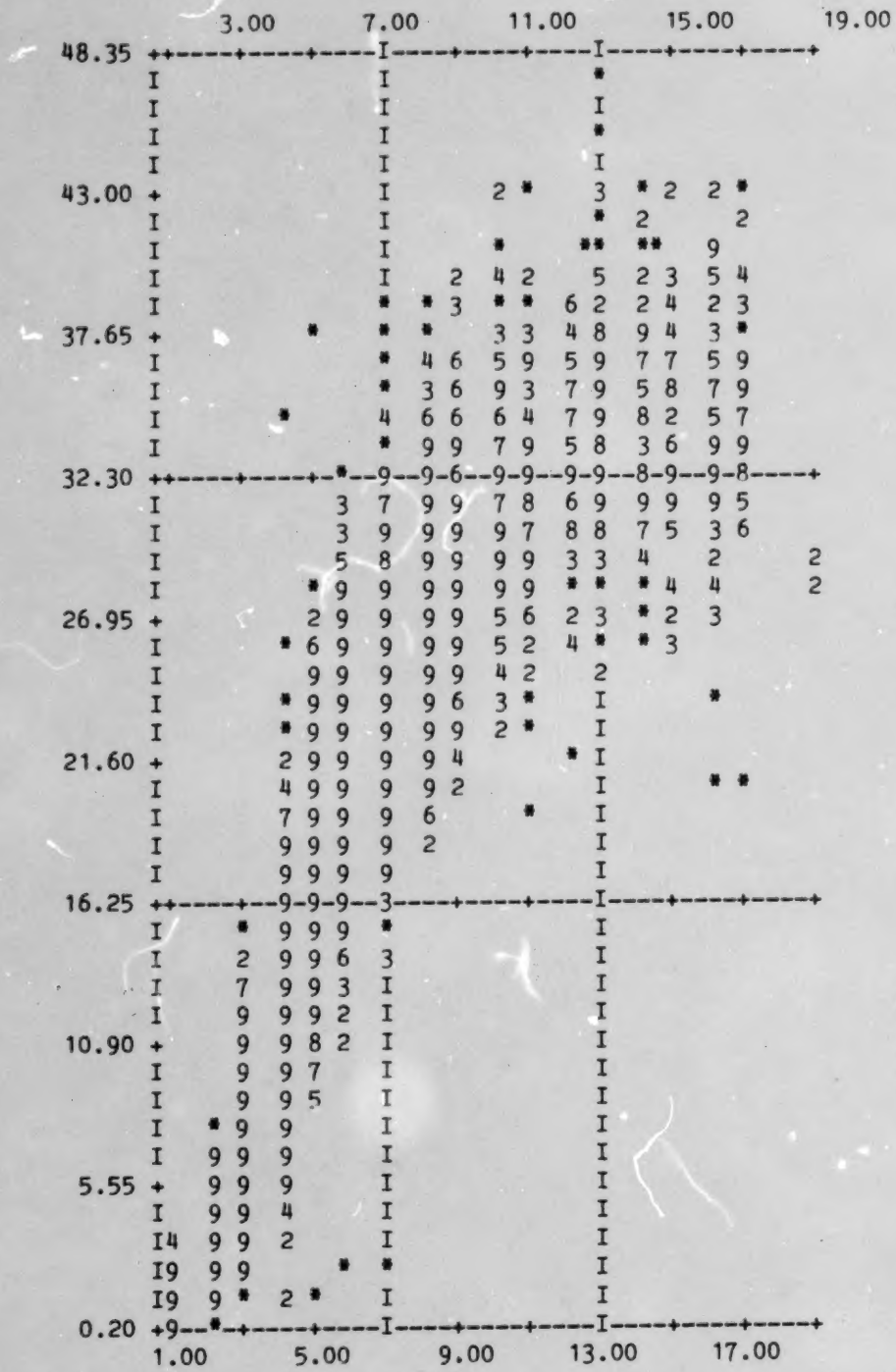
019. CHOOSE ONE REPORTING FEATURE:
1. ENVIRONMENT/HUSBANDRY
2. CLINICAL CHEMISTRY
3. HEMATOLOGY
4. TEST METHODS
5. BODY WEIGHT AND FOOD/WATER CONSUMPTION
6. STATISTICAL ANALYSIS

/ 6

THERE ARE 3 ANIMAL GROUPS REMAINING IN YOUR SEARCH

```
DO YOU WANT TO LIMIT YOUR DATA BY AGE, SEX, OR TEST YEAR?
    / NO
LADB STATISTICS REPORT     27-JAN-1981     18:24:12

023. CHOOSE LADB STATISTICAL SERVICE:
    / ?

023. CHOOSE LADB STATISTICAL SERVICE:
  1. DISTRIBUTIONS - SUMMARY STATISTICS, FREQUENCY HISTOGRAM &/OR
     TABLES
  2. CROSSTABULATION & CHI-SQUARE TEST
  3. BREAKDOWN - ANY COMBINATION OF ANIMAL GROUP(S), SEX, AGE, AND
     TEST YEAR
  4. T-TEST
  5. ONE-WAY ANALYSIS OF VARIANCE WITH STATISTICS
  6. SCATTERPLOT WITH LINEAR REGRESSION AND CORRELATION
    / 6

DO YOU REQUIRE INFORMATION ON THE USE OF THE SCATTERPLOT SERVICE?
    / NO

038. CHOOSE INDEPENDENT VARIABLE (X-AXIS):
  1. AGE CATEGORY
  2. TEST YEAR
    / 1

ENTER DATA ELEMENT ABBREVIATION FOR THE DEPENDENT VARIABLE (Y-AXIS)
    / BWT

PRINT OFF-LINE?
    / NO

PLEASE WAIT WHILE LADB PREPARES YOUR REPORT
```

(DOWN) BODY WEIGHT IN KG
(ACROSS) AGE CATEGORY



THE ABOVE PLOT CAN BE REPRESENTED BY THE LINEAR EQUATION:

BWT = 0.3893 + 2.7347 * AGE

WHERE:

CORRELATION (R) = 0.9079, R SQUARED = 0.8244
STD. ERROR OF R = 4.7871
SIGNIFICANCE R = SIG. AT .01 LEVEL

INTERCEPT (A) = 0.3893, STD. ERROR OF A = 0.1038
SIGNIFICANCE A = SIG. AT .01 LEVEL

SLOPE (B) = 2.7347, STD. ERROR OF B = 0.0166
SIGNIFICANCE B = SIG. AT .01 LEVEL

036. FOLLOWING STATISTICS REPORT, CHOOSE YOUR NEXT STEP:
/ 4

SEARCH EXAMPLE 4
Pathology of the Canine Lymphoid System

Strategy Outline

Menu 007	Type of Animal	2. Dog
Menu 050	Type of Dog	1. All
Menu 011	Proceed to Reporting	
Menu 019	Reporting Feature	2. Pathology
	Limiting by Sex	
Menu 044		3. Sex
Menu 012	Sex	2. Female
Menu 100	Pathology Report	2. Lesion Frequency by Organ and Age
Menu 140	Organ System	8. Lymphoid
Menu 148	Item of Interest	4. Spleen
Menu 160	Major Change	10. Growth Alteration
Menu 150	Items of Interest	3. All
Menu 162	Description of Lesion	7. Tumor Status
	Single Report for Combined Animal Groups	
Menu 036	Next Step	5. Stop LADB

Preparing a Pathology Report Showing Growth Alterations of the Spleen in Female Dogs.

```
003. CHOOSE LADB SERVICE:
    / 1

007. CHOOSE ONE TYPE OF ANIMAL:
    / 2

050. CHOOSE TYPE(S) OF DOG:
    / ?

050. CHOOSE TYPE(S) OF DOG:
  1. ALL
  2. BEAGLE
  3. ENGLISH FOXHOUND
    / 1

 THERE ARE 51  ANIMAL GROUPS FOR YOUR SEARCH

011. FOR THESE ANIMAL GROUPS, CHOOSE YOUR NEXT STEP:
    / ?

011. FOR THESE ANIMAL GROUPS, CHOOSE YOUR NEXT STEP:
  1. PROCEED TO REPORTING WITHOUT FURTHER REFINEMENT
  2. REFINE YOUR SEARCH BY SELECTING BY ENVIRONMENT
     OR HUSBANDRY FACTORS
    / 1

019. CHOOSE ONE REPORTING FEATURE:
  1. ENVIRONMENT/HUSBANDRY
  2. PATHOLOGY
  3. ORGANS EXAMINED
  4. CLINICAL CHEMISTRY
  5. HEMATOLOGY
  6. TEST METHODS
  7. BODY WEIGHT AND FOOD/WATER CONSUMPTION
  8. ORGAN WEIGHT
  9. STATISTICAL ANALYSIS
    / 2
THERE ARE 11  ANIMAL GROUPS REMAINING IN YOUR SEARCH

DO YOU WANT TO LIMIT YOUR DATA BY AGE, SEX, TEST YEAR
OR MANNER OF DEATH?
    / YES

044. CHOOSE ONE OR MORE ITEMS OF INTEREST:
  1. TEST YEAR
  2. AGE CATEGORY
```

```
  3. SEX
  4. MANNER OF DEATH
    / 3

012. FOR SEX
CHOOSE 1. FIND, 2. LIST, 3. STOP
    / 2

AVAILABLE SELECTIONS FOR SEX:
  1. ALL
  2. SEX=FEMALE (  23 )
  3. SEX=MALE (  27 )

SELECT ITEM(S) OF INTEREST:
  / 2

100. CHOOSE PATHOLOGY REPORT:
    / ?

100. CHOOSE PATHOLOGY REPORT:
  1. LESION FREQUENCY BY ORGAN(S) FOR THE SPECIFIED
     CATEGORY(IES) OF MAJOR CHANGE
  2. LESION FREQUENCY BY ORGAN AND AGE
  3. LESION FREQUENCY BY ANIMAL AND AGE
    / 2

PLEASE WAIT WHILE LADB PREPARES YOUR REPORT

LADB PATHOLOGY REPORT 28-MAY-1981 17:29:41

LESION FREQUENCY BY ORGAN AND AGE

140. CHOOSE ONE ORGAN SYSTEM OF INTEREST:
    / ?

140. CHOOSE ONE ORGAN SYSTEM OF INTEREST:
  1. AUDITORY
  2. BODY CAVITIES AND ASSOCIATED TISSUES
  3. CARDIOVASCULAR
  4. DIGESTIVE
  5. ENDOCRINE
  6. HEMATOPOIETIC
  7. INTEGUMENTARY
  8. LYMPHOID
  9. MUSCULO-SKELETAL
 10. NERVOUS
 11. OCULAR
 12. REPRODUCTIVE
 13. RESPIRATORY
 14. URINARY
 15. MULTIPLE ORGANS
```

```
 16. SITE UNKNOWN
    / 8

148. FOR THE LYMPHOID SYSTEM CHOOSE ONE ITEM OF INTEREST:
    / ?

148. FOR THE LYMPHOID SYSTEM CHOOSE ONE ITEM OF INTEREST:
  1. HEMOLYMPH NODE
  2. LYMPH NODE
  3. PEYERS PATCH
  4. SPLEEN
  5. THYMUS
  6. TONSIL
    / 4

160. FOR THE ORGAN YOU HAVE SELECTED
     CHOOSE ONE MAJOR CHANGE:
    / ?

160. FOR THE ORGAN YOU HAVE SELECTED
     CHOOSE ONE MAJOR CHANGE:

  1. TRAUMATIC ABNORMALITIES
  2. CONGENITAL MALFORMATIONS
  3. ABNORMAL PREGNANCY AND ABORTION
  4. MECHANICAL ABNORMALITIES
  5. INFLAMMATION
  6. FIBROSIS
  7. DEGENERATION AND NECROSIS
  8. DEPOSITION
  9. FINE STRUCTURE ALTERATIONS
 10. GROWTH ALTERATIONS
 11. NEOPLASMS
 12. PARASITOSES
    / 10


   LADB HAS IDENTIFIED    23 PATHOLOGY RECORDS
WHICH MUST BE RETRIEVED AND PROCESSED IN ORDER TO LIST
THE SPECIFIC CHANGES AVAILABLE FOR THE CATEGORY OF
MAJOR CHANGE YOU SELECTED.

THE MAJOR CHANGE SELECTED DOES NOT OCCUR
IN YOUR DATA SET IN WHICH THE SPLEEN
WAS EXAMINED IN   14 ANIMALS


  NOTE: YOUR DATA SET INCLUDES MULTIPLE ORGAN DATA
        WHICH IS NOT INCLUDED IN THIS REPORT.  YOU CAN RUN THE
        REPORT AGAIN USING MULTIPLE ORGANS AS AN ORGAN; AND/OR
```

YOU CAN RUN REPORT 3 FOR A TRUE FREQUENCY BY ANIMAL

****

NOTE: YOUR DATA INCLUDES SOME RECORDS FOR WHICH THE
NUMBER OF ORGANS EXAMINED IS NOT KNOWN. THESE RECORDS WERE NOT
INCLUDED IN THE PROCESSING JUST COMPLETED. LADB WILL PROCESS
THESE RECORDS FOR YOU AS A SEPARATE GROUP.

LADB HAS IDENTIFIED 16 PATHOLOGY RECORDS
WHICH MUST BE RETRIEVED AND PROCESSED IN ORDER TO LIST
THE SPECIFIC CHANGES AVAILABLE FOR THE CATEGORY OF
MAJOR CHANGE YOU SELECTED.

150. THE FOLLOWING SPECIFIC CHANGE(S) WERE FOUND IN YOUR DATA:
CHOOSE ITEM(S) OF INTEREST
1. HYPOPLASIA
2. MEGAKARYOCYTOSIS
3. ALL
/ 3

THERE MAY BE A DELAY WHILE LADB PROCESSES YOU DATA
IN PREPARATION FOR YOUR NEXT SELECTION. PLEASE BE PATIENT.

162. IN ADDITION TO THE MAJOR CHANGE AND SPECIFIC CHANGE(S)
YOU HAVE SELECTED, THE FOLLOWING DESCRIPTORS ARE
AVAILABLE TO DESCRIBE THE LESION OF INTEREST.
CHOOSE ITEM(S) OF INTEREST:

1. TOPOGRAPHY
2. SPECIFIC SITE
3. DISTRIBUTION
4. LESION DURATION
5. INTENSITY
6. ETIOLOGY
7. TUMOR STATUS
8. ALL
9. NONE, PRODUCE THE REPORT
/ 7

FOR THE SPECIFIC CHANGES REMAINING,
THERE IS NOTHING INDICATED FOR TUMOR STATUS

PRINT OFF-LINE?
/ NO

PLEASE WAIT WHILE LADB PREPARES YOUR REPORT

CHOOSE REPORTING OPTION:

1. SEPARATE REPORT FOR EACH ANIMAL GROUP
2. SINGE REPORT FOR COMBINED ANIMAL GROUPS
/ 2

PATHOLOGY REPORT
LESION FREQUENCY BY ORGAN AND AGE

PAGE 1

- - - -

AGE GROUPS(MONTHS)	12.00 - 14.99	15.00 - 17.99
TOTAL ANIMALS EXAMINED IN THIS AGE GROUP	12	2
FREQUENCY BY ORGAN	2	0

AGE GROUPS(MONTHS)	18.00 - 20.99	TOTALS
TOTAL ANIMALS EXAMINED IN THIS AGE GROUP	2	28
FREQUENCY BY ORGAN	1	4

NOTE -- TWO PATHOLOGY REPORTS WERE REQUIRED FOR YOUR DATA. THE FIRST REPORT INCLUDES DATA FROM ANIMAL GROUPS IN WHICH THE NUMBER OF ORGANS EXAMINED COULD BE DETERMINED; THE SECOND INCLUDES DATA FROM ANIMAL GROUPS IN WHICH THE NUMBER OF ORGANS EXAMINED COULD NOT BE DETERMINED.
NO ANIMALS ARE DUPLICATED.

WOULD YOU LIKE TO RECEIVE A SUBGROUP BREAKDOWN FOR THE ORIGINAL DATA RECORDS (THOSE ENTERING THE PATHOLOGY REPORTING MODULE)?
/ YES

PRINT OFF-LINE?
/ NO

PATHOLOGY REPORT
SUBGROUP BREAKDOWN

PAGE 1

THE FOLLOWING SUBGROUPS ARE REPRESENTED IN THE ABOVE SUMMARY -

ANIMAL GROUP NUMBER	AGE GROUP MONTHS	SEX	MANNER OF DEATH	NUMBER ANIMALS WITH NEOPLASMS	NUMBER DEATHS (AGE GROUP)
22	8.00 - 8.99	F	I	0	5
22	9.00 - 9.99	F	I	0	1
22	10.00 - 10.99	F	I	0	3
22	11.00 - 11.99	F	I	0	1
22	12.00 - 14.99	F	I	0	6
22	15.00 - 17.99	F	I	0	1
22**	18.00 - 20.99	F	I	0	2
23**	9.00 - 9.99	F	I	0	1
23	10.00 - 10.99	F	I	0	1
23	12.00 - 14.99	F	I	0	1
24**	12.00 - 14.99	F	I	0	3
25	12.00 - 14.99	F	I	0	2
25	15.00 - 17.99	F	I	0	1
154	10.00 - 10.99	F	I	0	2
155	9.00 - 9.99	F	I	0	2
156	9.00 - 9.99	F	I	0	2
157	10.00 - 10.99	F	I	0	2
158	10.00 - 10.99	F	I	0	3

PATHOLOGY REPORT
SUBGROUP BREAKDOWN

PAGE 2

THE FOLLOWING SUBGROUPS ARE REPRESENTED IN THE ABOVE SUMMARY -

ANIMAL GROUP NUMBER	AGE GROUP MONTHS	SEX	MANNER OF DEATH	NUMBER ANIMALS WITH NEOPLASMS	NUMBER DEATHS (AGE GROUP)
159	9.00 - 9.99	F	I	0	2
160	10.00 - 10.99	F	I	0	2

TOTAL NUMBER OF ANIMALS WITH NEOPLASMS - 0
TOTAL NUMBER OF ANIMALS EXAMINED - 43

LEGEND -- S = SPONTANEOUS, I = INDUCED

* -- LESIONS CONTRIBUTING TO THE FREQUENCIES IN THE FIRST REPORT OCCURRED IN THESE SUBGROUPS (NUMBER OF ORGANS EXAMINED WAS KNOWN)

** -- LESIONS CONTRIBUTING TO THE FREQUENCIES IN THE SECOND REPORT OCCURRED IN THESE SUBGROUPS (NUMBER OF ORGANS EXAMINED WAS NOT KNOWN)

END OF REPORT

036. FOLLOWING PATHOLOGY REPORT, CHOOSE YOUR NEXT STEP:
/ ?

036. CHOOSE YOUR NEXT STEP:
1. PRODUCE ANOTHER REPORT
2. PRODUCE A DIFFERENT TYPE OF REPORT (MENU 019)
3. REFINE YOUR SEARCH BY SELECTING E/H FACTORS (MENU 014)
4. START OVER (MENU 003)
5. STOP LADB
/ 5

DO YOU WISH TO ENTER COMMENTS REGARDING YOUR SEARCH?
/ NO

020. SIGNING OFF

SESSION TIME WAS 9 MINS. 5 SEC

GOODBYE

$$$$$$$$$ LOGGED OUT AT 28-MAY-1981 17:33:25.79

INDEX

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National Institute of Health
Environmental Protection Agency
Chemical Information System
(NIH/EPA CIS)

Johanna Ross
Physical Sciences Library
University of California, Davis

The Chemical Information System (CIS) was created to support the scientific and administrative needs of the National Institute of Health and Environmental Protection Agency (NIH/EPA) personnel in the monitoring of the Toxic Substance Control Act. Technical needs fall primarily into two categories; identification of chemical compounds and an assessment of their toxic effects. Administrative needs typically involve up to date knowledge of legislation or regulations regarding handling, transportation, monitoring of effluents and quick access to information pertaining to the handling of unknown chemicals under emergency or spill spill conditions. Chemical compounds included in the system come from 66 different collections supplied by laboratory and agency personnel who have a continuing need for data on selected chemical compounds.

Chemical compounds contained in the 66 collections are assigned to any one of the appropriate subfiles in the CIS database (see appendix 1 for a list of collections and subfiles). A special SELECT command provides the capability to restrict searching to a particular collection should this be desired. When informtion on a chemical compound from a collection is received, it is entered directly into the specified subfile and is immediately searchable there by the nomenclature used in that collection. It is later verified by Chemical Abstracts Service, assigned a registry number and entered into the master file, the Structure and Nomenclature Search System (SANSS). In the SANSS master file, chemical information is cross referenced, expanded, and standardized. Unless one is certain that the vocabulary to be used is in the subfile of choice, the SANSS master file should be used first to locate the registry number, which is the common link between files. In the aggregate, the chemicals contained in the subfiles total approximately 200,000 compounds, all searchable in SANSS after verification has been completed, although subfiles may contain as little as a few hundred compounds or a maximum of approximately 35,000 compounds.

The SANSS master file has some features in common with the Lockheed CHEMNAME file. Brand or trivial names may be used to locate preferred names and registry numbers. In addition, SANSS contains chemical structure and property information. It can be searched for molecular weight, whole or ranged; molecular formula, whole or ranged; ring, structure, and substructure features. When a compound is located, SANSS will tell you which subfiles contain information on the compound, and will give the subfile accession number, if applicable, and the CAS registry number.

A special command GO _ enables you to transfer easily from the file you are in to the one you wish to go to. If you wish to stay in the file you are in but print the unit record from another file, there are universal commands, for example OTSHOW, which will permit the printing of the unit record of one file while in another.

Some of the collections have printed equivalents, such as the EPA/NIH Mass Spectral Data System, the NIOSH Registry of Toxic Effects of Chemical Substances, the NBS X-ray Crystal collection and the Merck

Index. Many of the smaller collections of chemicals monitored by NIH/EPA do not have printed equivalents. There are 17 active subfiles, with other subfiles under development. Some files, SANSS, CRYST, CHEMLAB, etc. may be seached with a graphics or a standard terminal. The mathematical modeling system is accessible only via the graphics method. The graphics capability is not illustrated in this paper.

In general, the subfiles may be divided into three categories: 1) Data analysis files or more technically, analytical chemistry files (MSSS, CRYST, CNMR, PDSM, IRSS, XTAL) 2) informational and numerical (RECTCS, OHMTADS, WDROP, CTCP) and 3) Bibliographic files (FRSS, NMRLIT).

Since EPA collects samples of effluents and monitors the content of bodies of water, there is a continuing need to identify chemical compounds found in samples. Several files, the data analysis files, were developed for the analytical chemist to help him identify sample constituents. The chemist uses the analytical method of choice to obtain properties of compounds, then matches these properties against those contained in the file(s). One of the more popular identification files, the Mass Spectral Search System (MSSS) permits peak and intensity information to be input into the system. The system responds by telling how many compounds match the data. Additional peaks may be entered until identification is reduced to a single compound, or to a small number of compounds. A printout of total properties of the selected chemicals will permit a positive match with the unknown compound.

To illustrate how the system might be used, a topic of current interest may help us understand the system and at the same time contribute to our personal assessment of a pesticide to which many Californians may be exposed, Malathion. We should first go to the SANSS file. When we use the option NPROBE and the query Malathion, we retrieve one item and request a print. The information provided includes the CAS registry number, the collections from which information was supplied, and the CIS subfiles where information may be found, the chemical structure and the CAS preferred name(s).

```
Structure and Nomenclature Search System
(Version 3.19/4.3) March, 1980 ($60/hr)          (Fig. 1)

Complete data base selected.
Option? nprobe

Fragment or whole name search  (F/W)  (F)?w

Specify name (CR to exit):          malathion

File     2,        1 compounds having name:      MALATHION
Specify name (CR to exit):
```

```
Option? sshow 2

Entry        1   CAS RN 121-75-5
CIS Sources Of Information
```

(Fig. 1 Cont'd)

```
     2 - CIS, EI Mass Spectrometry
     5 - EPA/CIS, OHM/TADS: 72T16532
    32 - NIOSH/CIS, RTECS: WM8400000
   115 - EPA/CIS, WaterDROP
   124 - CIS, CI Mass Spectrometry

22 Non-CIS References Available

                                                C10H1906PS2

      S
      +
      +
C**O**P**S**C**C**C**O**C**C
      *      *      +
      *      *      +
      O      C++O   O
      *      *
      *      *
      C      O
             *
             *
             C
             *
             *
             C

Butanedioic acid, [(dimethoxyphosphinothioyl)thio]-, diethyl ester (9C
     I)
Succinic acid, mercapto-, diethyl ester, S-ester with O,O-dimethyl pho
     sphorodithioate (8CI)
ac 26691
[(Dimethoxyphosphinothioyl)thio]butanedioic acid diethyl ester
American Cyanamid 4,049
  83 more names available
```

The information provided indicated 83 more names are available. Should we wish to see these, we can tailor the print by setting the format with the SETDC option. Since we can expect these additional names to be trade names with little or no chemical meaning, we need not do this.

When we examine the printout, we have a better understanding of the chemical nomenclature of the compound, but no real data. To obtain this, we must examine the CIS sources of information and go to the subfiles which have been referenced. We now need to know something about subfile content to pick the best file(s).

We note that two of the referenced collections have data in the Mass Spectrometry subfile, MSSS, a file for the analytical chemist. Since we are not trying to identify a chemical unknown, we can skip the collections in that subfile. This leaves three remaining collections, in three subfiles. Both OHMTADS (Oil and Hazardous Materials Technical Assistance Data System) and RTECS (Registry of Toxic Effects of Chemical Substances) contain technical information. Which will best serve our purpose?

OHMTADS is the file designed to provde information under emergency conditions on hazards which may result from spills. It contains chemical and physical properties, mode of transport, and results of toxicity tests under controlled conditions for aquatic and plant life. The major threat, together with actions to be taken to ameliorate that threat, are identified. Protective measures for workers handling the chemical are also provided. In total, 126 items of information may be given, if all apply.

```
Option? go ohmtads


OHM/TADS (VERSION 4.15/3.0) ($36/hr)
```

(Fig. 2)

```
Latest news for OHMTAD . . .
 15 Mar 81; Offline PRINT Procedures Revised
Option? mat/malathion

File:  4  Count:      1

Option? cas/121-75-5

File:  5  Count:      1

Option? acc/72t16532

File:  6  Count:      1

Option? type 4/2

                File  4: Entry    1
  (1) TECHNICAL ASSISTANCE DATA SYSTEM:  72T16532
  (2) CAS REGISTRY NO:  121755
  (3) SIC CODE:  2879; 2842
  (4) MATERIAL:  $$$ MALATHION $$$
  (5) SYNONYMS:  PHOSPHOTHION, MERCAPTOTHION, CARBOFOS; EPN,
AMERICAN-CYANIMIDE-4049 DICARBETHOXYETHYL-O-O-DIMETHYLDITHIOPHOSPHATE
INSECTICIDE-4049, MALATHON
O-O-DIMETHYL-DITHIOPHOSPHATE-OF-DIETHYL-MERCAPTOSUCCINATE
  (6) TRADE NAME (COMPANY NAME):  CARBOPHOS, CYTHION (CYANAMID), MLT
(SUMITOMO); KARBOFUS
  (7) CHEMICAL FORMULA:  (CH3O)2(P:S)SCH(COOC2H5)CH2COOC2H5;
  (9) COMMON USES:  INSECTICIDE FOR FRUIT, VEGETABLE, ORNAMENTALS,
```

HOUSEHOLD AND LIVESTOCK USE;
(10) RAIL TRANSPORT (%): 17.0
(11) BARGE TRANSPORT (%): 00.8
(12) TRUCK TRANSPORT (%): 80.2
(13) PIPE TRANSPORT (%): 000.
(14) CONTAINERS: LINED DRUMS;
(15) GENERAL STORAGE PROCEDURES: KEEP IN WELL VENTILATED AREA.
(16) GENERAL HANDLING PROCEDURES: WEAR RUBBER GLOVES FOR ALL HANDLING.
(17) PRODUCTION SITES:
AMERICAN CYANAMID, DEEP WATER, N.Y.
CHEM. INSECTICIDE CORP, MT PLEASANT, TENN.
(22) SYNERGISTIC MATERIALS: SYNERGISTIC EFFECT BETWEEN MALATHION AND ITS TWO BASIC HYDROLYSIS PRODUCTS SYNERGISTIC EFFECT WITH EPD G-15
(25) LAB DETECTION LIMIT (PPM), TECHNIQUES, REF: <1(PPB) ECGC D-11
(26) STANDARD CODES: EPA 311; NFPA 3,-,-
(27) FLAMMABILITY: NON-FLAMMABLE
(30) TOXIC COMBUSTION PRODUCTS: PHOSPHORUS OXIDES, EXTREMELY HAZARDOUS FUME, ENTER WITH CARE
(31) EXTINGUISHING METHODS: SELF-CONTAINED BREATHING APPARATUS, RUBBER GLOVES, HATS SUITS AND BOOTS MUST BE WORN. HIGHLY TOXIC FUMES ARE IMMINENT.
(34) EXPLOSIVENESS: STABLE
(37) MELTING POINT (DEG C): 0002.9
(39) BOILING POINT (DEG C): 00157.
(41) SOLUBILITY (PPM), 25 DEG C: 0000145.
(43) SPECIFIC GRAVITY: 01.23
(44) VAPOR PRESSURE (MM HG): .00004
(45) VAPOR PRESSURE TEXT: .00004 MM HG AT 30 DEGREES CELSIUS;
(50) PERSISTENCY: AFTER 2 WEEKS IN RIVER WATER 10% REMAINED, AT 4 WEEKS NONE REMAINED. RAPIDLY HYDROLYZED AT PH <5 OR PH >7.(R-102) PERSISTENT IN SOIL FOR 1 WEEK; (D-6) SUBJECT TO HYDROLYSIS AND ATTACK AT THE SULFUR ATOM. (R-105) HYDROLYSIS HALF-LIFE (PH 6, 70 DEG C. ETHANOL) 7.8 HR. CHANGES BY; IRON CATALYZES DECOMPOSITION. FACTOR OF 10 FOR EACH PH UNIT ABOVE PH 8. CHEMICAL HYDROLYSIS INITIATES; DEGRADATION.(R-102) AT PH 6.8-7, 27 DEG C HYDROLYSIS HALF-LIFE IS ONE MONTH; WHEREAS AT PH 9, 27 DEG C HALF-LIFE IS 10 HR. IN WATER WITH NO HUMIC SUBSTANCES; PHOTOLYSIS HALF-LIFE IS 990 HR, WHILE WITH HUMICS IT IS 15 HR. AT 28 DEG C WITH; LOW LEVELS OF BACTERIA, BIOCHEMICAL HALF-LIFE IS 41 HR.(R-185);
(51) POTENTIAL FOR ACCUMULATION: NEGATIVE;
(52) FOOD CHAIN CONCENTRATION POTENTIAL: NEGATIVE;
(54) CARCINOGENICITY: TESTS WITH RATS PROVED NEGATIVE D-4
(55) MUTAGENICITY: SUSPECTED OF REACTING WITH DNA. POTENTIAL;
(56) TERATOGENICITY: CHICKS FED 75PPM/DAY HAD CONGENITAL MALFORMATIONS. POTENTIAL; D-4
(57) FRESHWATER TOXICITY NUMBER (PPM): .033; .089; .12; .130; 5.0; .120; 5.0; .15; 0.090; .20; 0.10; .12; 12.5; .265; 12.5; 16; .100; 11; .120; .0074; .0009; 8; .0056; 8.97; .100; 12.9; .056; 10.7; .032; 6.59; 8.970; 8.65; 12.9; .103; 10.7; .17; 8.65; .285; 6.59; .110; .17; .2; .103; .101; .285; .263; .170; .24; .200; .12; .101; 10; .263; 10; .0036; .0195; .17; 1.9; .15; .56; .12; .0038; .05; .01; .023; .013; .094; .035; 13.6; .0018; 11.4; .006; 8.9; .02; 23; >20; .09; .84; .00162; .05; .007; 77; 68; 110; .1; .007; .003; .002; .0009; .0002; .005; .0046; .0028; .0023; .04; .036; .025; .023
(58) FRESH WATER TOXICITY TEXT
CONC.(PPM)/EXPOS.(HR)/SPECIE/EFFECT/TEST ENV/REF

(Fig. 2 Cont'd)

.0036/24/CHAOBORUS ASTICTOPUS/FOURTH INSTAR LARVAE/ /E-126
.0195/24/BROOK TROUT/LC50/ /E-187;
.17/24/FALL CHINOOK FINGERLINGS/TLM/ /E-151
1.9/24/FOWLERS TOAD TADPOLES/LC50/ /E-187; (Fig. 2 Cont'd)
.15/48/FALL CHINOOK FINGERLINGS/TLM/ /E-151
.56/24/CHORUS FROG TADPOLES/LC50/ /E-187;
.12/96/FALL CHINOOK FINGERLINGS/TLM/ /E-151
.0038/24/GAMMARUS LACUSTRIS/;
.05/24/MOSQUITOFISH/40%LETHAL/IN ACETONE/E-146
.01/24/P. BADIA/LC50/ /E-187;
.023/96/CHINOOK/TLM/ /E-102
.013/24/C. SABULOSA/LC50/ /E-187;
.094/96/THREESPINE STICKLEBACK/TLM/ /E-102
.035/24/P. CALIFORNICA/LC50/ /E-187;
13.6/96/R BALTEATUSHYDROFLOX/TLM/SOFT/E-127
.0018/48/GAMMARUS LACUSTRIS/LC50/ /E-187;
11.4/96/R BALTEATUS HYDROFLOX/TLM/SOFT/E-127
.006/48/BAETIS SP/LC50/ /E-187;
8.9/96/R BALTEATUS HYDROFLOX/TLM/SOFT/E-127
.02/48/P. CALIFORNICA/LC50/ /E-187;
23/96/FATHEAD MINNOW/TLM/100% TECH./E-107
>20/48/RED CRAWFISH/LC50/ /E-187;
.09/96/BLUEGILL/TLM/100%TECH./E-107
.84/96/GUPPY/TLM/100% TECH./E-107
.00162/96/GAMMARUS LACUSTRIS/TLM/IN ACETONE/E-130
.05/96/PTERONARCYS CALIF. (NAIAD)/TLM/ /E134
.007/96/ACRONEURIAPACIFICA/TLM/95% ACTIVE IN ACETONE/E-134
77/96/RAINBOW/TLM/TEMP45F/E-105
68/96/RAINBOW/TLM/TEMP55F/E-105
110/96/RAINBOW/TLM/TEMP65F/E-105
.1/96/EPHEMERELLA GRANDIS/TLM/ /E-95
.007/96/HYDROPSYCHE CALIFORNICA/TLM/SOFT/E-95
.003/48/SIMOCEPHALUS SERRULATUS/EC50/ /E-111
.002/48/DPULEX/EC50/ /E-111
.0009/64/D MAGNA/IMMOBILIZED/TEMP 78F/E-97
.0002/64/D CARINATA/IMMOBILIZED/TEMP 78F/E-97
.005/24/RAINBOW/TLM/MO.RIVER/E-153
.0046/48/RAINBOW/TLM/MO.R/E-153
.0028/96/RAINBOW/TLM/MO.R/E-153
.0023/120/RAINBOW/TLM/MO.R/E-153
.04/24/RED SHINER/TLM/MO.R/E-153
.036/48/RED SHINER/TLM/MO.R/E-153
.025/96/RED SHINER/TLM/MO.R/E-153
.023/120/RED SHINER/TLM/MO.R/E-153
(61) SALT WATER TOXICITY NUMBER (PPM): .15; 9.07; .1; 2.66; .1; 3.3; .008; .33; .033; .032; 1.25; 1; 1; .2; 1
(62) SALT WATER TOXICITY TEXT
CONC.(PPM)/EXPOS.(HR)/SPECIE/EFFECT/TEST ENV/REF

.15/48/KILLIFISH/50% KILL/ /D-8
9.07/48/OYSTER EGGS/LC50/LAB/R-109;
.1/ /SPOT/76% ENZYME ACTIVITY/ /E-125
2.66/336/OYSTER LARVAE/LC50/LAB/R-109;
.1/ /SHEEPSHEAD MINNOW/39% ENZYME ACTIVITY/ /E-125

(Fig. 2 Cont'd.)

.033/24/ATLANTIC SALMON/TLM/ /D-1
.089-.131/96/BLUEGILL/LC50/FLOW-THROUGH/R-109;
.12/96/ATLANTIC SALMON/TLM/ /D-1
.13/96/BROOK TROUT 1.15 G/LC50/FLOW-THROUGH/R-109;
5.0/ /TROUT/100% KILL/ /D-1
.12/96/BROOK TROUT 2.13 G/LC50/FLOW-THROUGH/R-109;
5.0/ /YELLOW PERCH/100% KILL/ /D-1
.15/96/CUTTHROAT TROUT .33 G/LC50/FLOW-THROUGH/R-109;
0.090/96/BLUEGILL/TLM/ /D-4
.2/96/CUTTHROAT TROUT 1.25 G/LC50/FLOW-THROUGH/R-109;
0.10/24/TROUT/50% KILL/ /D-4
.12/96/RAINBOW TROUT .41 G/LC50/FLOW-THROUGH/R-109;
12.5/96/FATHEAD/TLM/SOFT WATER/G-21
.265/96/COHO SALMON 1.7 G/LC50/FLOW-THROUGH/R-109;
12.5/96/FATHEAD/TLM/HARD WATER/G-21
16/96/FATHEAD MINNOW/LC50/STATIC/R-109;
.100/24/RAINBOW/LC50 /G-21
11/336/FATHEAD MINNOW/LC50/FLOW-THROUGH/R-109;
.120/24/BLUEGILL/LC50/ /G-21
.0074/96/PUNTIOUS TICTO/LC50/ /R-109;
.0009/48/DAPHNIAMAGNA/TLM/59% ACTIVE IN XYLENE/G-21
8/48/HARLEQUIN FISH/LC50/STATIC AND FLOW-THROUGH/R-109;
.0056/96/AERONIUSIA PACIFIC/TLM/59% ACTIVE IN XYLENE/G-21
8.97/96/CHANNEL CATFISH/LC50/STATIC/R-109;
.100/96/PTERONARCYS CALIFORNICA/TLM/XYLENE/G-21
12.9/96/BLACK BULLHEAD/LC50/STATIC/R-109;
.056/96/CLAASSENIA SABULOSA/TLM/XYLENE/G-21
10.7/96/GOLDFISH/LC50/STATIC/R-109;
.032/96/ARETOPSYCHE GROUNDIS/TLM/XYLENE/G-21
6.59/96/CARP/LC50/STATIC/R-109;
8.970/96/CATFISH/TL50/PREDICTED/G-19
8.65/96/FATHEAD MINNOW/LC50/STATIC/R-109;
12.9/96/BULLHEAD/TL50/PREDICTED/G-19
.103/96/BLUEGILL/LC50/STATIC/R-109;
10.7/96/GOLDFISH/TL50/PREDICTED/G-19
.17/96/LARGEMOUTH BASS/LC50/STATIC/R-109;
8.65/96/MINNOW/TL50/PREDICTED/G-19
.285/96/SMALLMOUTH BASS/LC50/STATIC/R-109;
6.59/96/CARP/TL50/PREDICTED/G-19
.11/96/RAINBOW TROUT/LC50/STATIC/R-109;
.17/96/SUNFISH/TL50/PREDICTED/G-19
.2/96/BROWN TROUT/LC50/STATIC/R-109;
.103/96/BLUEGILL/TL50/PREDICTED/G-19
.101/96/COHO SALMON/LC50/STATIC/R-109;
.285/96/BASS/TL50/PREDICTED/G-19
.263/96/YELLOW PERCH/LC50/STATIC/R-109;
.170/96/RAINBOW/TL50/PREDICTED/G-19
.24/96/STRIPED BASS FINGERLING/LC50/STATIC/R-109;
.200/96/BROWN TROUT/TL50/PREDICTED/G-19
.12/96/BLUEGILL FINGERLING/TL50/STATIC 23 DEG C/R-112;
.101/96/COHO/TL50/PREDICTED/G-19
10/24/CHANNEL CATFISH FINGERLING/TL50/STATIC 23 DEG C/R-112;
.263/96/PERCH/TL50/PREDICTED/G-19
10/24/HARLEQUIN FISH/LC50/ /E-187;

3.3-10/48/COCKLE/LC50/STATIC AERATED/R-109;
.008-3.2/96/MARINE FISH/LC50/ /E-152
.33-1/48/BROWN SHRIMP/LC50/STATIC AERATED/R-109; (Fig. 2 Cont'd)
.033-.083/96/MARINE CRUSTACEA/LC50/ /E-152
.032/24/GRASS SHRIMP/LC50/ /R-33;
1.25/24/SPOT/LC50/APPROXIMATE/R-32;
1/24/PINFISH/LC50/APPROXIMATE/R-32;
1/24/CROAKER/LC50/APPROXIMATE/R-32;
.2/24/SHEEPSHEAD MINNOW/LC50/APPROXIMATE/R-32;
1/48/PINK SHRIMP/LC50/APPROXIMATE/R-32;
(63) ANIMAL TOXICITY VALUE: 4000; 2830; 1156; 750; 1375; 1000; >4444; 1485; >5000; 2500; 3300; 2000
(64) ANIMAL TOXICITY TEXT
VALUE/TIME/SPECIES/PARAM./ROUTE/REF.

4000/ /MUS/LD50/ORL/D-2;
2830/ /RAT/LD50/ORL/D-1;
1156/ /RAT/LD50/ORL/R-1;
750/ /RAT/LD50/IPR/R-1;
1375/ /RAT MALE/LD50/ORL/APD;
1000/ /RAT FEMALE/LD50/ORL/APD;
>4444/ /RAT/LD50/SKN/APD;
1485/ /YOUNG MALLARD/LD50/ORL/E-187;
>5000 PPM/5 DAY/MALLARD/LC50/ORL IN DIET/E-187;
2500-4500 PPM/5 DAY/PHEASANT/LC50/ORL IN DIET/E-187;
3300-3700 PPM/5 DAY/BOBWHITE/LC50/ORL IN DIET/E-187;
2000-2300 PPM/5 DAY/DOTURNIX/LC50/ORL IN DIET/E-187;
(65) CHRONIC ANIMAL TOX LIMIT (PPM): 100.
(66) REF FOR CHRONIC ANIMAL TOX LIMIT: D-13 DOG
(69) WATERFOWL TOXICITY (PPM): 0001485.
(70) REF FOR WATERFOWL: MG/KG LD50 D-31
(79) MAJOR SPECIES THREATENED: MARINE LIFE AND GAME FISH
(82) INHALATION LIMIT (VALUE): 0000015.
(83) INHALATION LIMIT TEXT: (MG/M3)
(84) IRRITATION LEVELS (VALUE): 0000015.
(85) IRRITATION LEVELS TEXT: (MG/M3)
(86) DIRECT CONTACT: SKIN
(87) GENERAL SENSATION: RECOGNITION ODOR IN AIR 10 MG/M3.
(100) DIRECT HUMAN INGESTION (MG/KGWT): 0002.
(101) REF FOR DIRECT HUMAN INGESTION:
D-12
(102) REC DRINKING WATER LIMITS (PPM): 000000.1
(103) REF FOR REC DRINKING WATER LIMITS: , E-233
(108) PERSONAL SAFETY PRECAUTIONS: PROTECTIVE CLOTHING AND FILTER MASK RECOMMENDED.
(109) ACUTE HAZARD LEVEL: APPEARS TO BE ABOUT 100 TIMES LESS TOXIC TO MAMMALS THAN PARATHION. LETHAL DOSE IN MAN IS ESTIMATED AT 860 MG/KG. LETHAL THRESHOLD VALUES MINIMUM LC VALUES TROUT-0.24 CAMBARUS-240.0 CARP-720.0
(110) CHRONIC HAZARD LEVEL: ADVERSE EFFECTS ARE NOTED IN GOLDFISH AT 0.1 MG/L. RATS FED 1000 PPM FOR 92 WEEKS SHOWED NORMAL GROWTH.(R-102) APPLICATION FACTOR; FOR NO EFFECT FROM 96 HR LC50 VALUE - .02 FATHEAD MINNOW AND BROOK TROUT, .04; FOR BLUEGILL.(R-131) NO EFFECT LEVEL IN FIELD STUDIES WITH RATS, 100 PPM R-203;

(111) DEGREE OF HAZARD TO PUBLIC HEALTH: EXTREME HAZARD IN DISASTER CIRCUMSTANCES. HAS MUTAGENIC AND TERATOGINIC POTENTIAL.
(112) AIR POLLUTION: HIGH
(113) ACTION LEVELS: EVACUATE AREA. ENTER FROM UPWIND SIDE. NOTIFY LOCAL AIR AUTHORITY AND NATIONAL AGRICULTURAL CHEMICALS ASSOCIATION.
(114) IN SITU AMELIORATION: CARBON AND PEAT CAN BE USED AS SORBENTS.
(116) AVAILABILITY OF COUNTERMEASURE MATERIALS: CARBON-WATER TREATMENT PLANTS, SUGAR REFINERIES PEAT-NURSERIES, FLORAL SHOPS
(117) DISPOSAL METHODS: DECOMPOSES AT HIGH TEMPERATURE. HYDROLYZES RAPIDLY IN ACID AND ALKALI. 1) MIX WITH EQUAL PARTS SAND AND CRUSHED LIMESTONE, SPRAY WITH FLAMMABLE SOLVENT, PLACE IN OPEN INCINERATOR, AND LIGHT WITH EXCELSIOR TRAIN. STAY UPWIND. 2) MIX WITH EQUAL PARTS SAND AND CRUSHED LIMESTONE IN PAPER BOX AND IGNITE IN INCINERATOR WITH AFTERBURNER AND ALKALINE SCRUBBER.
(118) DISPOSAL NOTIFICATION: LOCAL AIR AUTHORITY. (Fig. 2 Cont'd)
(120) EFFECTS ON WATER TREATMENT PROCESS: IN LOW LOADINGS, STIMULATES GROWTH OF SEWAGE ORGANISM. IN HIGHER LOADINGS, MAY INHIBIT OR DESTROY ORGANISMS. LOAD IS A FUNCTION OF MALATHION PER UNIT ORGANISMS NOT MALATHION PER UNIT WATER.
(121) MAJOR WATER USES THREATENED: FISHERIES
(122) PROBABLE LOCATION AND STATE OF MATERIAL: WILL SINK TO BOTTOM AND DISSOLVE VERY VERY SLOWLY. CLEAR AMBER LIQUID. FORMULATED AS CONCENTRATE, EMULSIFIABLE CONCENTRATE, WETTABLE POWDER, OR DUST. WETTABLE FORMS WILL DISSOLVE.
(123) SOIL CHEMISTRY: LEACHING IS A VIABLE ROUTE OF TRANSPORT IN SOIL.(R-203) ABSORPTION IS BEST IN HIGH ORGANIC CONTENT, ENHANCED BY PRESENCE OF METALLIC CLAYS.(R-102).
(124) WATER CHEMISTRY: HYDROLYZES RAPIDLY AND IS SUBJECT TO ATTACK AT THE SULFUR ATOM. IRON CATALYZES DECOMPOSITION. ALSO SUBJECT TO PHOTOLYSIS. THIS IS ACCELERATED BY THE PRESENCE OF HUMIC SUBSTANCES.

We could have remained in the SANSS component and used the universal command OTSHOW/registry number or OTSHOW/file number. When we are in the OHMTADS file, the type command or the OTSHOW command may be used.

The salt water and freshwater toxicity tests document the buildup of the pesticide under various conditions of exposure. By monitoring the concentration of the pesticide in various bodies of water, it would be possible to assess the buildup in ppm for aquatic life. Since fisheries are listed as the major threat, this is quite valuable information.

The concentrations, of themselves, are not sufficient to measure the extent of the threat. LD50 doses are required and these are available from RTECS. If one knows the chemical in queston, the print version of RTECS will provide the same information as the computer version. The strength of RTECS is that in the computer version, other access points are available.

Option? go rtecs (Fig. 3)

RTECS Search System (Version 3.2/3.2 April, 1980) ($36/hr)
Option? tshow 121-75-5

CAS RN 121-75-5 NIOSH number WM8400000

SUCCINIC ACID, MERCAPTO-, DIETHYL ESTER, S-ester with O,O-DIMETHYL PHO
SPHORODITHIOATE
C10-H19-O6-P-S2

MUTAGEN DATA:	CODEN:
dnr-esc 100 ug/L	MUREAV 52,161,78
sce-hmn:fbr 5 mg/L	MUREAV 67,67,72

TOXICITY DATA:	CODEN:
orl-man LDLo:857 mg/kg	AEHLAU 21,533,70
orl-wmn LDLo:246 mg/kg	AEHLAU 33,240,78
orl-rat LD50:885 mg/kg	SPEADM 74-1,-,74
orl-rat TDLo:61 gm/kg/73W-C TFX:ETA	NCITR* NCI-CG-TR-192,79
skn-rat LD50:4444 mg/kg	CMEP** -,1,56
ipr-rat LD50:340 mg/kg	PSEBAA 114,509,63
scu-rat LD50:1000 mg/kg	JEENAI 50(3),356,57
ivn-rat LD50:50 mg/kg	ARZNAD 5,626,55
orl-mus LD50:775 mg/kg	ARZNAD 5,626,55
ipr-mus LD50:193 mg/kg	PSEBAA 129,699,68
ivn-mus LD50:184 mg/kg	CHABA8 52,16618,58
orl-rbt LDLo:1200 mg/kg	AEHA** 99-002-74/76
skn-rbt LD50:4100 mg/kg	28ZEAL 5,142,76
orl-gpg LD50:570 mg/kg	ARZNAD 5,626,55
ipr-gpg LD50:550 mg/kg	ARZNAD 5,626,55
orl-dom LD50:500 mg/kg	85DPAN -,-,71/76
unk-mam LD50:500 mg/kg	30ZDA9 -,357,71

DATA REFERENCES:	
AQUATIC TOXICITY RATING: TLm96:10-under 1 ppm	WQCHM* 3,-,74
THRESHOLD LIMIT VALUE-air:10 mg/m3 (skin)	DTLVS* 3,148,71
TOXICOLOGY REVIEW	AQMOAC #73-19,1973
TOXICOLOGY REVIEW	RREVAH 46,1,73
TOXICOLOGY REVIEW	CNDQA8 10(3),43,75
TOXICOLOGY REVIEW	PMDCAY 10,85,74
TOXICOLOGY REVIEW	DTTIAF 80(20),485,73
TOXICOLOGY REVIEW	RREVAH 63,1,76
TOXICOLOGY REVIEW	27ZTAP 3,89,69
OSHA STANDARD-air:TWA 15 mg/m3 (skin) (SCP-U)	FEREAC 39,23540,74
DOT-ORM-A, LABEL:NONE	FEREAC 41,57018,76
OCCUPATIONAL EXPOSURE TO MALATHION recm std-air:TWA 15 mg/m3	NTIS**
NCI CARCINOGENESIS BIOASSAY COMPLETED;RESULTS NEGATIVE	NCITR* NCI-CG-TR-24,78
NCI CARCINOGENESIS BIOASSAY COMPLETED;RESULTS NEGATIVE	NCITR* NCI-CG-TR-192,79

The TSHOW command could have been used to print the RTECS information while we were in the SANSS file in the same manner as with OTSHOW above.

The remaining file, WDROP, contains the record of test results of samples taken from bodies of water or from sewage treatment plants. In this particuar instance, the inquiry by pesticide name indicates that only 5 samples monitored for pesticide content contained malathion. The record provides geographic location, name and type of the body of water, method of sampling, what was found, the level of concentration and the date. Geographic location and site description are valuable approaches. When we search for Mat/Malathion and State/Ca, we find no samples which meet the criteria. The five samples are all from Alabama. Should we wish to use the system to monitor the environmental effects of spraying done in California, no doubt the information will be in the system at a later date.

```
Option? go wdrop                                        (Fig. 4)

WDROP System (VERSION 2.8/3.1) June 1980  ($36/hr)

Latest news for WDROP  . . .
 20 July 80; CAS Registry Numbers Restored, Other Changes Made
Option? mat/malathion

File:  7  Count:      5

Option? cas/121-75-5

File:  8  Count:      5

Option? type 8/2/1-5

                File  8: Entry      1
CITATION NUMBER=  4001
Malathion (121-75-5)

surface water from Locust Fork Branch of Black Warrior River;
Birmingham, AL, USA; Survey done: 10-?-69; sampled by Not Reported;
Analysis method: GCMS Specific method: EI, Specific method: ;
Identification confirmed; conc. not reported

Laboratory code: 0005; Coden: EPA6-

                File  8: Entry      2
CITATION NUMBER=  4002
Malathion (121-75-5)

surface water from Black Warrior River; Demopolis, AL, USA; Survey
done: 9-?-70; sampled by Not Reported; Identification confirmed;
conc. not reported
```

Laboratory code: 0005; Coden: EPA6-

(Fig. 4 Cont'd)

File 8: Entry 3
CITATION NUMBER= 63004
Malathion (121-75-5)

sampled by Unspecified sampling method; surface water from Black Warrior River; Survey done: 10-?-69; Birmingport, solvent extraction; AL, USA; source of contaminant was Mosquito control program in area had involved spraying of malathi on; Analysis method: GCMS Specific method: EI, Specific method: ; Identification confirmed; conc. not reported

Laboratory code: 0005; Coden: EPA9-

File 8: Entry 4
CITATION NUMBER= 63005
Malathion (121-75-5)

sampled by Unspecified sampling method; surface water from Locust Fork Branch; Survey done: 9-?-70; Demopolis, solvent extraction; AL, USA; source of contaminant was Mosquito control program in area had involved spraying of malathi on; Analysis method: GCMS Specific method: EI, Specific method: ; Identification confirmed; conc. not reported

Laboratory code: 0005; Coden: EPA9-

File 8: Entry 5
CITATION NUMBER= 63006
Malathion (121-75-5)

sampled by Unspecified sampling method; surface water from Locust Fork Branch; Survey done: 9-?-70; Demopolis, solvent extraction; AL, USA; source of contaminant was Mosquito control program in area had involved spraying of malathi on; Analysis method: GCMS Specific method: EI, Specific method: ; Identification confirmed; conc. not reported

Laboratory code: 0005; Coden: EPA9-
Option? logoff

Your approximate total CIS session cost is $ 18.87
User [7703,13] job 13 NDC#4 off TTY2 at 5:27 PM Wed 14-Oct-81
Connect time 0:26 CRU'S 2557

Now that we have an overview of the CIS system and some technical information on a timely topic, let us examine some subfiles in order

to become aware of the unique features of each file. Other than the printout in the Malathion example, RTECS will not be included since it is being covered in another section of this report.

The information files are of general interest since they provide information other than chemical compound properties. The file with the most content, OHMTADS, has 126 different categories of data for each compound although individual compounds may not have data listed for each data element. Each category has a mnemonic abbreviation which is searchable with the prefix/data element format. In figure 2, note that mat/malathion, cas/121-75-5, and acc/72t16532 all retrieve one document. The three approaches were used for demonstration only, any one of the three would have been sufficient. Printing the results of any of the search statements would have yielded the same information.

Other access points could have been used but these may have resulted in more than one compound meeting the specified criteria. Should we have wished to use the boiling point directly we could input blp/157. Should we wish to allow a margin of error, we could request blp/155 to 160. Other properties could be used to narrow the search, if they are known.

OHMTADS full panoply of seach options can be amply demonstrated by using the system to identify a compound from a hazardous spill. An actual situation occuring in Pennsylvania will be used. A freight train, with one of it's tanker cars containing a flammable material, has been derailed near a river. One of the cars is ablaze, and has ignited one of several leaks from the tanker car, while others are entering the river. Our problem is to identify the most probable materials which may be leaking from the tanker car. The following facts have been observed.

1) transported by rail in tanker car.

2) flammable.

3) an odor of almonds lingers in the air.

4) it appears to be yellow but upon entering the water, the color becomes green to yellow in appearance.

5) the ignited leak is extinguished upon entering the water.

Using the different pieces of data as input, we identify the material as nitrobenzene.

Option? ral and con/tank and loc/liquid and yellow

File: 14 Count: 15 (Fig. 5)

Option? #14 and (col/green or yellow) and flm and ext/water

```
File: 15  Count:      4

Option? # 15 and jns/almond

File: 16  Count:      1                                    (Fig. 5 Cont'd)

Option? type 16

                File 16: Entry     1
  (4) MATERIAL:  $$$ NITROBENZENE $$$
```

Almost all of the 126 different pieces of information are searchable, other pieces of data could also have been used, should they be known.

The Distributed Register of Organic Pollutants in Water (WDROP) is a collection of data concerning the concentration of organic chemicals found in water and sediments, along with where, when, and how these chemicals were found. The data base contains citations identifying organic pollutants since 1970. The data is abstracted from the open literature as well as from proceedings of meetings, internal government reports and private communications.

Data elements such as melting point (MP) and boiling point (BP) Registry number (CAS) are accessed in much the same manner as OHMYADS (BP/_, MP/_, CAS/_). In addition there are data elements for type of body of water (lake, river, ocean, canal, aquifier names), geographic locations (city, county, country) water treatment method, and treatment plant names.

If we wished to determine the threat of the pesticide Dieldrin to the aquatic life in the Sacramento River, we simply enter the mneumonic for material with the material name to determine the concentration of the pesticide:

```
Option? sfriv/sacramento and mat/dieldrin

File:  4  Count:      4                              (Fig. 6)


Option? type 4/2/1

                File  4: Entry      1
CITATION NUMBER=  193836
Dieldrin (60-57-1)
1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octanhydro-endo
-exo-1,4:5,8-dimethanonaphthalene
1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4
-endo,exo-5,8-dimethanonaphthalene

surface water from Sacramento River; grab sample; solvent extraction;
Survey done: 9-23-64; California Basin; Greens Landing, CA, USA;
Analysis method: GC Microcoulometric titration; Identification
probable; Water solubility: Insoluble; Melting point: 175-176 Deg. C;
average concentration .004 uG/L

Laboratory code: 0018; Coden: PHRPA6 80(6), 481-493 (1965)
```

The technical data file,Clinical Toxicology of Commercial Products (CTCP)is the online version of the work by R. E. Gosselin, et al. It contains 20,500 compounds. Information content includes the manufacturer, primary trade name, uses, and ingredients for most major commercailly available products, many of them common household items. Once the chemical content of an item has been determined, the information can be used as input in other files such as OHMTADS or RTECS to assess the magnitude of the danger. Foods are excluded from the data base.

There are 11 seachable fields: ingredient full name (MAT), ingredient name fragment (FTG), ingredient CAS registry number (CAS), ingredient location number (LOC), primary trade name (PTN), manufacturers approved use (MNU), usage codes (USS) manufacturers identity (PROD). date of entry (DOE) and date of last activity (DAC).

Suppose your child had found a bottle of mop and glow wax and had drunk a substantial amount. CTCP can provide the chemical content of the product.

```
Option? ptn/mop and glow

No responses for: PTN/MOP AND GLOW                    (Fig. 7)

Option? expand mop

MOORWOOD   (In: PTN/2)
MOORWOODBLEACHINGOIL (In: PTN/1)
MOORWOODPENETRATINGSTAIN  (In: PTN/1)
MOOVIT     (In: PTN/1)
MOP   (In: PTN/9 MAU/6 USS/10)
MOP&GLOWAX (In: PTN/1)
MOPDRESSING     (In: MAU/3)
MOPMAGIC   (In: PTN/1)
MOPS  (In: USS/1)
Option? ptn/mop&glowax

File:  6 Total number of products found:      1
         Number of current products:          1

Option? ptn/mop & glo wax

File:  7 Total number of products found:      1
         Number of current products:          1

Option? ptn/mop and glo

File:  8 Total number of products found:      1
         Number of current products:          1
```

```
Option? type 6/2/1

Entry      1 Accession #      19431                (Fig. 7 Cont'd)
MOP & GLO WAX
  FLOOR/CLEANER/POLISH
  (Lehn & Fink)
                              Date of entry:          1-73
                              Date of last activity:  5-74
    Ingredient Name                    CAS RN  Loc #          Amount
-------------------------------------------------------------------
  Acrylic copolymer.............                                15%
  Glycol ether derivatives.....                                 4%
  Alkyl phenyl ethoxylates.....                                 2%
  Styrene copolymer.............                                1%
  Ethylene glycol..............    107-21-1  398               trace
  Ammonium hydroxide...........    8[illegible]7-57-6   55b    trace
  PMA..........................                                trace
  Water........................                                77%
-------------------------------
```

Note that trade names have unique spellings. If the expand command had not been used, it might have been assumed that the compound was not in the data base.

Suppose, further, that some comet cleanser might have been ingested. Again, we use the same approach, but more than one product has this as a primary trade name. By using the short form print command. we are able to scan the product line and to choose the proper compound. We can then request a full printout.

```
Clinical Toxicology of Commercial Products Search System
                (Version 1.04/1.1) ($60/HR)

Latest news for CTCP   . . .                              (Fig. 8)
 28  Sept 80; Extraneous Permanent Disk Files May Have Been Left By CTCP
Option? ptn/comet

File:  5 Total number of products found:      5
         Number of current products:          3

Option? type 5/4/1-5/c


Entry      1 Accession #       8354
COMET (National Formula)
-------------------------------

* * *      1 Other Formulations available


Entry      3 Accession #       8355
COMET PAINT & VARNISH REMOVER
-------------------------------
```

```
* * *      1 Other Formulations available

Entry      5 Accession #      21246                    (Fig. 8 Cont'd)
COMET (No-Phosphate Formula)
-------------------------------

Option? type 5/2/1


Entry      1 Accession #      8354
COMET (National Formula)
  Household cleaner
  CLEANER/HOUSEHOLD/CLEANSER
  (Procter & Gamble)
                          Date of entry:          11-74
                          Date of last activity:  12-74
    Ingredient Name                  CAS RN   Loc #          Amount
-------------------------------------------------------------------
  Silica.....................     7631-86-9     6             50-74%
  Chlorinated sodium
   phosphate*(!)..............                                10-24%
  Sodium sulfate.............     7757-82-6   147d             5-9%
  Linear alkylate sulfonate....               830a             1-4%
  Complex sodium phosphate.....                                5-9%
(!)Phosphates                                 129
-------------------------------

* * *      1 Other Formulations available
```

Let us now turn to files which supply a different kind of information. The data elements used as inputs are physical properties of compounds. The properties are supplied by the various instruments used in chemical analysis. There are several files supplying information of this type. The most important is the MSSS.

MSSS (Mass Spectral Seach System) contains mass spectral data for over 34,000 compounds. The information in this file corresponds to the printed version by Heller and Milne published as the NSRDS-NBS 63. Although the printed equivalent has indexes by molecular weight, molecular formula, chemical substance name and CAS registry number, the analytical chemist won't know any of these when the spectrum of his unknown emerges from the mass specgtrograph.

To better understand the MSSS system, it is helpful to know what is happening when analysis is done. The compounds in the sample being analyzed are separated by a capillary column apparatus. As each compound emerges from the sample, it is run through the mass spectrograph. The location of each peak and its intensity is recorded. The highest peak corresponds to the total ion charge. Lesser peaks correspond to decomposition products. Classes of compounds have characteristic decomposition patterns, so even if an exact match is not obtained, using MSSS to retrieve related compounds may be quite helpful.

Although the system was designed primarily for NIH/EPA personnel, many samples they analyze contain a variety of natural products. The data has been used to successfully identify the many natural products contained in wine and to identify the chemical compounds contained in burning rice straw. Compounds commonly found in samples gathered by NIH/ EPA are likely to be found in MSSS.

The most common method of identifying a spectrum in MSSS is by peak and intensity match. To do this we specify PEAK when the option is requested. The program responds by asking for the location of the peak and the min int and max int (minimum and maximum intensity) Since there may be some differences between spectrographs, it is best to allow a margin of error above and below the measured intensity value. If the measured intensity was 70, one might specify a minimum intensity of 40 and a maximum intensity of 100. The systems responds with the number of the compounds that have peaks within the specified range and then requests another peak. The next highest peak is then specified. The system then automatically ANDs the first peak specified with the second and tells how many compounds have both peaks in their spectrum. This can be repeated until the unknown compound is identified or until we are certain that no compound meets the criteria.

```
Option? peak

Type peak,min int,max int
CR to exit, 1 for CAS RN, QI, MW, MF and Name

User:298,0,100

File  4 contains 1060 references to m/z   298

Next request: 344,50,100

File  5 contains   11 references to m/z   298  344

Next request: 326,0,100

File  6 contains    6 references to m/z   298  344  326

Next request: 1

How many (E to Exit)? 6

Type E to terminate display.
   CAS RN      QI    MW Formula, Names
    520-85-4  527   344 C22H3203
                      Pregn-4-ene-3,20-dione, 17-hydroxy-6-methyl-,
                           (6.alpha.)- (9CI)
                      Pregn-4-ene-3,20-dione, 17-hydroxy-6.alpha.-m
                           ethyl- (8CI)
                      Farlutal
                      Medroxyprogesteron
                      Medroxyprogesterone
```

(Fig. 9)

(Fig 9 Cont'd)

2484-50-6	654	344	C21H2804 Pregn-4-ene-3,15,20-trione, 17-hydroxy- (8CI)
2868-02-2	546	344	C22H3203 Pregn-4-ene-3,20-dione, 17-hydroxy-16-methyl-, (16.alpha.)- (9CI) Pregn-4-ene-3,20-dione, 17-hydroxy-16.alpha.-methyl- (8CI) 16.alpha.-Methyl-17.alpha.-hydroxyprogesterone
6030-25-7	521	344	C22H3203 18-Norpregn-4-ene-3,20-dione, 13-ethyl-17-hydroxy- (8CI9CI) 17.alpha.-Hydroxy-18-methylprogesterone 17-Hydroxy-18-methylprogesterone
14991-62-9	319	344	C19H2006 [2]Benzopyrano[4,3-b][1]benzopyran-6a(7H)-ol, 5,12a-dihydro-2,3,10-trimethoxy- (8CI9CI)
38636-86-1	585	344	C18H1607 11H-Dibenzo[b,e][1,4]dioxepin-7-carboxylic acid, 8-hydroxy-3-methoxy-1,4,6-trimethyl-11-oxo- (9CI) Notatic acid

Before searching for a match for a second unknown compound, the system must be cleared from information on the first by exiting the loop with a second CR. Many subfiles in CIS have subroutines that must be overriden before a new search approach can be undertaken. CIS provides instructions for exiting the loop; e.g. CR to exit, when an option is chosen. It is important to understand that in CIS one needs to read the response of the computer, not just note the number of items that meet the input criteria. When exact matches are not obtained, or when information on related compounds is desired, other options are available. Partial formula searches are one way of obtaining information on certain classes of compounds. To do a partial formula search, simply enter MF in response to the option inquiry.

To find all the compounds in a system which contain F6N3 we inquire

```
Option?  PF

Enter First Partial Formula (CR to exit) :  F6          (Fig 10)

File 1 contains 176 references to F6
List References (Y/N)?  N

Enter Next PF (CR to Exit, E to enter Peak Search):  N3

File 2 contains  1 References to F6 N3

List References?  (Y/N)
```

Other options are for peaks and complete molecular formula, partial formulas, peak and molecular weight and complete spectra searching. The system prompts you through each step onece the option has been chosen.

The CNMR (Carbon-13 Nuclear Magnetic Resonance) file contains over 9,000 spectra. The feature which enables identification by the CNMR pattern is the SHIFT command. The system prompts the user to enter the chemical shift, together with the deviation to be allowed; and if known, the single-frequency off-resonance decoupling multiplicity of the line. The specification of the line as a singlet, dublet, triplet or quartet; or simply as even or odd may also be used, if known, to limit the output. If no deviation is specified, the program assumes a default value of 0.5 ppm.

```
NIH/EPA/NIC Carbon-13 Nuclear Magnetic Resonance
Spectral Search System - Version 4.69/4.4 Dec. 1978 ($36/Hr)

Latest news for CNMR  . . .                                    (Fig 11)
 16 Sept 80; Many Shift Node Assignments In Data Base In Error

Option? shift

Enter Shift, Deviation, Mult.: 32,1,t

  1466 matches using   32.0

L(ist), Q(uit), or next Shift, Deviation, Mult.: 41.0,0.5

   183 matches using   32.0   41.0

L(ist), Q(uit), or next Shift, Deviation, Mult.: 45,1

    41 matches using   32.0   41.0   45.0

L(ist), Q(uit), or next Shift, Deviation, Mult.: 58

     8 matches using   32.0   41.0   45.0   58.0

L(ist), Q(uit), or next Shift, Deviation, Mult.: 1

    CAS RN        MF
109-55-7        C5 H14 N2
    1,3-Propanediamine, N,N-dimethyl-
109-55-7        C5 H14 N2
    1,3-Propanediamine, N,N-dimethyl-
54933-23-2      C15 H20 O4
    Azuleno[6,5-b]furan-2,6(3H,4H)-dione, 3a,4a,5,8,9,9a-hexahydro-4-hyd
    roxy-3,7,8-trimethyl-, [3R-(3.alpha.,3a.alpha.,4.beta.,4a.alpha.,8a.
    alpha.,9a.beta
```

```
57031-41-1      C21 H34 O2
    Androstan-11-ol, acetate, (5.alpha.,11.alpha.)- (9CI)
474-08-8        C27 H45 N1 O1
    Solanidan-3-ol, (3.beta.,5.alpha.)- (9CI)          (Fig. 11 Cont'd)
109-55-7        C5 H14 N2
    1,3-Propanediamine, N,N-dimethyl- (8CI9CI)
490-52-8        C20 H21 N1 O5
    Benzo[e][1,3]dioxolo[4,5-k][3]benzazecin-14(6H)-one, 5,7,8,15-tetrah
    ydro-4-hydroxy-3-methoxy-6-methyl- (8CI9CI)
57031-41-1      C21 H34 O2
    Androstan-11-ol, acetate, (5.alp   ,11.alpha.)- (9CI)
```

Partial formulas and complete molecular formulas may also be used in the same fashion as described in other CIS files. The CLERC option is similar to SHIFT but is broader in concept in that it retrieves similar spectra rather than a match.

The PDSM (Powder Diffraction Search Match) file contains over 34,000 diffraction patterns. Because of the amount of detail in the data, processing time may be excessive unless the file is partitioned into smaller subsets. Materials may be divided into organic, inorganic, mineral, nonmineral, and combination categories. The principal data match is done by entering the d-spacings together with minimum and maximum values for the intensity. The data may be modified after entry by changing background values and intensities. An error range, mathematically calculated to individual specifications, can be computed. The single Crystal Reduction and Search System (XTAL) uses the cell lattice parameters that are given in the Cambridge Crystal file. Data have been converted to the Buerger "reduced cells" using the method described by Azaroff and Buerger in "The Powder Method".

The major means of searching XTAL is with the CELL option. The system requests that the crystal lattice type be defined according to the following categories: P (primitive type) A (A-face) B (B-face) C (C-face) I(body centered) F (face centered) and R (Rhombohedral, indexed as hexagonal). When this is done, the dimensions and angles of the cell are given. When all the data have been entered, the system requests that the permissible deviation, expressed as a percentage, be defined.

The system uses a seven element vector for searching the unit cells. Elements 1-3 are Bueger reduced cell lengths, 4-6 are 1.0 Buerger reduced reciprocal cell lengths and 7 is the reduced cell volume. Search strategy may be carried one step further by performing a reduced subcell search. The precision of the data required illustrates why detailed knowledge of crystal structure is necessary before the file can be used.

The CRYST data bank contains all published data connected with chemical structures as revealed by x-ray or neutron diffraction studies. The data base contains over 25,000 entries of which about 18,000 contain full structural information. Each entry is comprised of the bibliographic information, data concerning the identity of the chemical compound, crystallographic data, and, if available, atomic

coordinate data for the compound in question. The crystallographic data in each entry includes the Space Group Number and the Standard Space Group Sumbol (Hermann- Mauguin), both of which are defined in the International Tables for X-Ray Crystallography (Knoch Press, Birmingham, England, 1969). CRYST also contains a powerful set of programs for the modelling of molecular structures. The modelling programs permit display of molecules and the calculation of parameters such as interatomic separation, bond angles and torsion angles. The modelling function requires a graphics terminal.

The data base has been designed so it may be partitioned into subsets with one or more of five qualifiers: STR, full atomic coordinate data; NEUT neutron diffraction studies; LOW low temperature measurements (below 273 K) ABS absolute configuration and PMORPH, polymorphic structure. When searching can be done on a partitioned file, search time is reduced.

Searching may be done by using the following designators: SPGR (space group search) entered in Hermann-Maugium notation; CELL, which produces a search through reduced cells that correspond to the materials in the NBS single crystal file; DEG, a temperature search which may be specified or ranged; CLASS, the chemical class of the compound (86 classes) and bibliographic entries searched through the labels AUTHOR, YEAR, CODE, etc.

NMRLIT (NMR Literature) is one of two bibliographic files in CIS. This data base contains citations for 34,000 compounds. Subject terms must be expanded by typing the first three letters of the subject name. Authors are entered by last name only, and it is recommended that author terms also be expanded before selection. Journal coden is also searchable. The unique feature of NMRLIT is that it can be searched by compound nucleus with the option NUC. If one wished to find NMR literature on calcium-43, it can be specified as ca43 or 43ca. Calcium alone may also be requested but this is not precise.

```
NMR Literature Search System (Version 2.05/3.0-April, 1980) ($36/hr)

Latest news for NMRLI  . . .
 1 Sept 80; Data Base Updated, Minor Software Enhancements Made

Option? nuc                                          (Fig. 12)

Nucleus Search
Enter element symbol preceded by isotope mass if known
Nucleus: 43ca

(D)irect/(I)ndirect/(B)oth - (D)? d

File   7 has     13 entries
Nucleus = CA       measured   directly
Nucleus: ca43

(D)irect/(I)ndirect/(B)oth - (D)? d

File   8 has     13 entries
Nucleus = CA       measured   directly
```

```
Nucleus:

Option? type 8

All Preston Abstract years (Y/N) (Y)? n

Available years - 64 through April 80

Enter desired years - Last 2 digits only
Years: 75 76 77

Type E to terminate display

Entry 4

ABS # = 770538
NEUMANN          TRAGER          KOWALSKY
NUCLEAR QUADRUPOLE MOMENT OF CALCIUM
Z. PHYS.
VOL = 279  PAGE = 0249

---------

Entry 5

ABS # = 750373
JACQUINOT        GOLDMAN         ABRAGAM
POLARIZATION TECHNIQUES IN NMR
PHYS. REV. LETTERS
VOL = 032  PAGE = 1096

Option? logoff
```

(Fig. 12 Cont'd.)

The Federal Register Search System (FRSS) has been made searchable in CIS from 1978. The compounds have been assigned registry numbers which are directly searchable. Each mention of a substance in FRSS results in a citation. That citation contains a description of the FR article insofar as it concerns the cited substance or substances, the agency or agencies involved, the actions being taken or proposed, significant dates, the affected sections of the CFR (Code of Federal Regulations) etc. Each data element is searchable by using the data element/ mnemonic If a phrase term is entered, it must be enclosed in double quotation marks since the system recognizes only single words. Carbon dioxide may be entered as "Carbon dioxide" or carbondioxide.

```
Option? "carbon dioxide"

File:  5  Count:      98
```

(Fig. 13)

```
Option? carbondioxide

File:  6  Count:      98

Option? go nmrlit
```

The term benzene retrieves all references to bezene, both text and keyword. Mat/benzene retrieves those where benzene is the keyword of the citation and Xmat/benzene retrieves those where benzene is a cross referenced material.

```
NIH/EPA/NIC Carbon-13 Nuclear Magnetic Resonance
Spectral Search System - Version 4.69/4.4 Dec. 1978 ($36/Hr)

Option? go frss
```

(Fig. 14)

```
Federal Register Search System (Version 4.11) ($60/hr)

Latest news for FRSS   . . .
 15 Mar 81; Offline PRINT Procedures Revised
Latest Data Base Update: 28 April 1981
Data base coverage: 1 Jan 78 through 24 Apr 81 (78,958 citations)
Option? benzene

File:  1  Count:     681

Option? mat/benzene

File:  2  Count:     135

Option? xmat/benzene

File:  3  Count:      17
```

Should one wish to determine if there had been a change in a code, simply enter the mneumonic and the CFR number. Cross references may be requested in the same manner.

```
Option? cfrchg/10cfr205
```

(Fig. 15)

```
File:  4  Count:      24
```

The mneumonic tags for data retrieval are: CIT (citation number), MAT (material or substance), NOM (same as MAT), NAM (same as MAT), FRG, (name fragment), CAS (CAS registry number), FREF (FR volume and page number), FRDAT (FR date of publicaton), XMAT (indirect reference to the material), XFRG (indirect reference to FRG), XCAS (indirect reference to CAS), TXT (text keywords), FRXRF (cross reference to prior FR article) CFRCHG (CFR sections changed), CFRREF (CRF sections referenced), DATCS (comments solicited by), DATDS (date solicited by),

DATEF (effective date) DATMT (date of scheduled meeting), DATOB (objections due by), DATPR (Opportunity for public hearing, requests due by), DATPH (public hearing scheduled on), DATPP (postponed until), DATPT (petitions due by), DATEX (expiration date), DATXX (miscellaneous date), and DATALL (all dates cited).

Although the SANSS master file is the connecting link between all files, other than using it as an illustration at the beginning it has been deliberately left to last. This was done in order that readers would not assume that everything in SANSS need to known before the Chemical Information System could be used. Most aspects of SANSS are straightforward and can be used without being intellectually intimidated. Should one believe that everything in SANSS need be mastered before using CIS, most would never touch the terminal. Unless substructure searching is required (graphics terminals are easier to use for substructure, but are not absolutely necessary), most of the instructions in SANSS should be passed over. Should one need the substructure feature, a substantial investment in time will be required to master all the varied commands required to perform substructure searching. It is highly recommended that a familiarity with the system be achieved from simpler searching before this is attempted.

Most of the times that SANSS will be employed will be to identify preferred names of compounds and to locate which files in the system contain information. This type of search is much like that done on the CHEMNAME file in Lockheed. Name fragments may be combined logically, or with other types of information such as molecular formula, molecular weight, number of rings, size of rings, etc. to arrive at the preferred name of a compound. Various print commands, entered via the SETDC option, may be used to extract the desired elements for printing. The default command was used in the illustration for malathion, at the beginning of this paper. Had we wished to use SANSS as a source for bibliographic information, we could have used the SETDC print format option to print out the 22 non CIS references available. We could have done the same to look at the 83 additional names for the compound.

The NPROBE (name probe), one of the most used options, permits truncation at three levels: prefix, suffix, and imbedded (:chloro aminophen: amino:ol). Judicious use of this powerful tool can help to isolate classes of compounds or to identify a specific compound.

Should the substructure feature be the option used, one should first try to identify a specific functional group present in the desired compound. A table, with an identifying code is included in the search manual. These codes may be entered directly using the option SPROBE. Using the structural feature option simplifys the inputting of structural information where common groups may be identified.

Use of the CIS system can provide information at a much greater depth than traditional online bibliographic tools. The analytical

chemist may not think of the library as a source of service of this type. Traditionally, laboratory personnel have had to purchase and program their own computers, often at great cost.

Librarians should publicize CIS capability to the campus community. The availability of CIS at UCD may eliminate the necessity for the purchase of a second generation mini-computer and save thousands of dollars and months of programming effort for the Spectroscopy Group. Those who specialize in a certain type of spectroscopy can master that part of the CIS file containing their information. Librarians can provide basic instruction on command language and advise them as to optimum approaches to needed data.

The provision of this kind of information represents a new frontier and a different kind of interface between users and information for librarians. CIS has provided $100/mo free time to academic institutions. This should remove any hesitation on anyone's part to try out or use the system. Librarians should not hesitate to make this powerful analytical and informational tool available to University personnel.

Appendix 1

Collections available in the NIH/ EPA Chemical Information System

0 Compounds not included in any other collection 13,593
1 EPA TSCA inventory list 43,277
2 CIS, Mass sepctrometry 33,898
3 CIS, Carbon-13 NMR spectrometry 7,565
4 EPA pesticides--active ingredients 2,103
5 CIS, EPA OHM/TADS 1,005
6 CIS Cambridge X-ray crystal 14,673
7 Merck index 8,979
8 EPA, pesticides--analytical reference standards 473
9 EPA storet 234
10 EPA, Chemical spills 577
11 EPA, AEROS SOTDAT 572
12 NIMH, Psychotropic drugs 2,036
13 EPA, AEROS SAROAD 65
14 CIS, NBS Proton Affinities 439
15 CPSC, CHEMRIC 890
16 EPA, Pesticides-registered inert ingredients 779
17 NBS gaseous ions 3,136
18 NFDA, hazardous chemicals 395
19 FDA/EPA, pesticide reference standards 612
21 U.S. International trade commission
22 NBS, Xray Crystal 18,169
25 EPA effluent guidelines 128
26 EPA Organic Chemical Producers 375
27 IPC Chemical products 104
28 IPC Chemical plant 103
29 NSF chemical list 224
30 EROICA, thermodynamics 4,488
31 PHS-149 Carcinogenic activity 4,416
32 CIS, NIOSH RTECS 26,974
33 NIOSH, NOHS 4,556
35 ORNL, EMIC 6,851
36 ORNL, ETIC 3,244
39 EPA/IERL, non criteria pollutant emissions 253
40 EPA, section 111D clean air act 2
42 EPA chemical indicators, industrial contamination 49
43 EPA selected organic air pollutants 591
45 Clean air act Section 112 5
47 EPA, carcinogen assessment group list of chemicals 41
53 API/TRC Thermodynamics and spectroscopy 3,297
55 WHO/FAO pesticide data sheets 20
58 EPA/NCTR, Industrial carcinogen and mutagen study 86
59 EPA, environmental carcinogen assessment program 27
61 DHEW/NCI Laboratory chemicals monograph 55
65 EPA/NSF econ and tox data selected comm chem 499
66 EPA restricted use pesticides 33
67 EPA compounds for mutagenicity evaluation 25
68 EPA, potential carcinogen study, selected chem 409
70 CIIT, priority chemicals lists (toxicological) 27
71 CIS JCPDS powder diffraction patterns 24,130

72 IARC monographs (carcinogenicity reviews) 388
74 EPA expanded potential industrial carcinogens and mutagens 1,444
75 tox tips 472
77 NLM CHEMLINE 31,176
78 USFWS fish control labe data base 97
82 NMFS Survey of trace elements 15
83 U.S. Military entomology information system 123
92 Interagency Testing Committee TSCA priority chemicals 6
94 NCI environmental determinants of cancer 74
95 EPA quality criteria for water 37
95 EPA quality criteria for water 37
97 NFPA 491 manual of hazardous chemical reactions 899
98 NFPA 325M fire hazard properties of flammables 1,150
100 WHO/FAD pesticide monographs 86
108 EPA, toxic substances control procedures 21
115 CIS EPA Water Drop 859
124 CIS CI mass spectrometry 1,147

Non-Bibliographic Data Bases for the Social Sciences

F. Slimp
Shields Library
University of California, Davis

A Practical Introduction to Searching NBDBS: Social Sciences

The number of nonbibliographic databases (NBDBS) in the social sciences is large, and growing larger almost daily. In fact, the social science files now contain the greatest number of NBDBS (and this situation is unlikely to change) as well as nonbibliographic files which among themselves show the most diversity in content and application.[1] It is, therefore, both a challenge and a pleasure to acquire some practical expertise in the use of the most basic of these files.

While the content and application of social sciences NBDBS is indeed diverse, it is also obvious that the majority is found in the area of business/economics. Again, this is as it should be, since the worlds of business and economics are the areas of applied social science par excellence, and the business/economics files exhibit just those characteristics of NBDBS which make a practical introduction helpful, namely 1.) the presence of large amounts of numerical and/or tabular data, and 2.) the heavy use of code searching. The additional factor in some files of online computational ability of retrieved or input data further distinguishes the business/economics files as among the most important and useful social sciences NBDBS. We will, then, lose nothing by concentrating our practical introduction on three file groups in this area, Disclosure, the EIS files, and the Predicasts family of statistical databases.

Disclosure (Dialog File 100)

Disclosure, produced by Disclosure, Inc., has the distinction of being the most complex of the business/economics NBDBS in file structure. This is due basically to the type of records which constitute this database, and the structure necessary to relate these records to each other from the entry point of a single originating company. The file contains financial information on approximately 11000 public companies who are required to file such information with the Securities and Exchange Commission. Each of these companies has a single "parent" record (designated by Dialog as the "profile", and containing basic information such as name, address, description of business, etc) and potentially numerous "children" records. These children or subrecords may be any or all of the reports required by the SEC: 10-K: annual report, 10-Q: quarterly report, 8-K: supplementary report of events not contained in 10-K or 10-Q, 20-K: annual report of foreign companies, Proxy statements, Registration statements, and Prospectuses. They contain such varied information as names of all corporate subsidiaries, names of corporate officers and directors, latest balance sheet information, material company litigation, name of company auditor, etc. Dialog has so structured these records that the retrieval of any subrecord retrieves the parent "profile" record as well. Sets so retrieved may then be limited to "profiles" to produce a unique listing of companies matching preselected criteria. Sorting capability is also highly developed,

enabling the creation of highly personalized data retrieval with an extremely broad range of potential applications. Two examples of Disclosure searching are given below.

Search I. Problem: Find public California companies that have been involved in environmental litigation during the past reporting period. Produce an alphabetized list of these companies.

STEP	ACTION	COMMENTARY
1	! 100	Begin File 100
2	S ST=CA	This produces a subset consisting of all companies who have given California as their state of registration.
3	S Environmental/PR	"Environmental" is here qualified to the Legal Proceedings field of the 10-K report.
4	Combine Steps 2*3	The resultant California companies are involved in legal proceedings over environmental concerns.
5	Limit Step 4/MAJ	Limit to company profiles for briefest listing of company names and addresses.
6.	Sort Step 5 by name and print required list	End of Search

(see terminal printout in Appendix)

Search II. Problem: For market research or job-hunting purposes, find public California companies with 500 or more employees. To utilize resources efficiently, list these companies by geographic area.

STEP	ACTION	COMMENTARY
1	! 100	Begin File 100
2	S ST=CA	Create set of California registered companies.

STEP	ACTION	COMMENTARY
3	S EM=000000500: EM=999999999	Using the Dialog range-searching capability, the Number of Employees field from the 10-K report is searched. The nine-digit field must be filled, hence the leading zeros in the lower parameter. Since a maximum number of employees has not been specified, the upper parameter may be 9-filled.
4	Combine Steps 2*3	The required state/employee number intersection is obtained.
5	Limit Step 4/MAJ	Limit to company profiles for briefest listing of names and addresses.
6	Sort Step 5 by zip code and company name; print required list.	End of Search

(see terminal printout in Appendix)

Practical applications abound for the Disclosure file, and price reductions have made it more attractive. Further suggestions for search technique may be found in the column "Applications Aplenty" in Disclosure's monthly newsletter, "Disclosure Online News."

EIS Files (Dialog Files 22 and 92)

Economic Information Systems, Incorporated, produces two closely related files: EIS Industrial Plants (Dialog File 22) and EIS Nonmanufacturing Establishments (Dialog File 92). EIS, Inc. has developed a wide variety of market research related products. Among these are directories of large firms and many specialized reports covering individual firms and industries. The online format of files 22 and 92 was designed by Predicasts, Inc., and in fact closely resembles the PTS files. Discussion of various interesting features of the Predicasts package that are also applicable to the EIS files will be reserved for treatment under the Predicasts files. Information is input from a variety of sources, including U. S. government census data and private business information sources.

Data in the two files can relate to either public or private companies. In this sense, the files can be said to cover a greater section of economic activity than that found in Disclosure. But while Disclosure contained company information, the EIS files contain plant or establishment information, so that a large company, public or private, may be found re-

presented in the EIS files by numerous records of local operating units. In a sense, going from Disclosure to the EIS files is similar to increasing the magnification on a microscope: one finds a great deal more information about a much smaller area. Local (county or State) business and economic activity is the area in which the EIS files excel. Examples of EIs searching are given below.

Search I. Problem: Find the medium to large sized manufacturing establishments in Yolo and Sacramento counties which might be attractive prospects for industrial equipment distributors.

STEP	ACTION	COMMENTARY
1	E CN=California, Sacramento	By expanding the Geographic Name field (CN=), we find the proper entry format for county units: STATE, COUNTY.
2	SS CN=California, Sacramento or CN=California, Yolo	Select and combine the desired local units.
3	E EX=	By expanding the Number of Employees field (EX=), we find the appropriate code for establishments having 100 or more employees, one way of describing medium to large sized operations.
4	S E9-E14	Select the appropriate codes.
5	E SD=	Another method of describing size would be to look at sales (in dollars). We therefore expand the Sales field (SD=).
6	S E15-E33	Select the codes representing sales of $1 million and over.
7	Combine Steps 2*(4+6)	Combine the geographic parameters with either size indication set.
8	Sort Step 7 by geographic location, sales volume, number of employees, and alphabetize; print required list.	End of Search

(see terminal printout in Appendix)

Search II. Problem: Is California agribusiness a concentrated industry? Find market share information which could answer this question.

STEP	ACTION	COMMENTARY
1	: 92	Begin File 92.
2	S BS=California	Selecting BS (Branch State)=California creates a set of all California non-manufacturing establishments.
3	E PN=agricultur?	By expanding PN(Product Name)=agricultur? we find the appropriate terminology for agricultural activities.
4	S E9-E10	Select the appropriate terms.
5	C Steps 2*4	Combine sets to isolate California agricultural production.
6	Sort Step 5 by share of market (descending) and alphabetize; print required list.	End of Search. Information thus collected and assembled could be used to examine what concentration, if any, exists in California agribusiness.

(see terminal printout in Appendix)

PTS Statistical Files (Dialog Files 81, 82, 83, 84) and Online Computational System

The Predicasts company is well represented among producers of online databases, furnishing no fewer than eight files to one or more of the major vendors.[2] Dialog mounts the company's databases of domestic and international statistics as files 81, 82, 83, and 84. Files 81 and 82 relate to the United States, and correspond to the company's print sources Predicasts and Predicasts Basebook, respectively. Files 83 and 84 are international and non-United States in coverage. File 83 corresponds to Predicasts Worldcasts. File 84 has no print equivalent. Files 81 and 83 contain near (ca. 5 years) and mid-term (ca. 10 years) forecasts of economic/demographic statistical series. Files 82 and 84 contain periodically revised historical data (usually 20-25 years) of these same series. Additionally, files 82 and 84 contain composite data (historical material and forecasts) for selected series of major importance.

The wealth of statistical material available, coupled with the ease of access and usefulness of format make these files resources of the utmost utility to users of statistics, particularly in business/economics, but also in the social sciences in general. Certain features of these files deserve a closer examination before actual examples of searching them are given.

The Predicasts "family" of online files probably would not exist without the U.S. government's Standard Industrial Classification (SIC) codes. From the 4-digit, hierarchically structured SIC codes Predicasts has elaborated an intricate system of coded information retrieval generally operative in all the files, with various file specific exceptions. The following observations apply as well to the EIS files.

First, Predicasts expanded the 4-digit SIC code to 7-digit specificity. However, not just products have been coded, but also numerous activities, concepts, and processes, e.g., marketing procedures, energy conservation techniques, research and development outlays, etc. Predicasts calls such non-product expanded SIC coded items "Event Codes." As might be expected, "Event Names," "Product Names," and "Measure Names" correspond to the above Codes. Second, all codes are "cascaded" (as far back as single digits, if desired), providing for automatic truncation. For example, PC 1499212=asbestos fibers, PC 1499200=asbestos, PC 1499000=minerals and rocks, NEC, PC 149 000=nonmetal minerals, NEC, PC 140 000=nonmetal mining, and 100 000=mining and extractive industries. The Product Codes and Event Codes are most successfully used together where the Event Code is a "partitioning Device" for the Product Code, that is, where a definite aspect of a particular industry is being examined (e.g., sales in the wine industry, energy conservation techniques in the construction industry, etc). Nevertheless, there will be many instances in which the best procedure will be to get advice from the vendor representative(s) before uncritically combining Event Codes and Product Codes.

The PTS statistical files also provide a unique online computational system. In files 81, 82, 83, and 84 searchers have at their immediate disposal what amounts to a pocket Statistical Package for the Social Sciences (SPSS). This program will tabulate, graph, and perform various statistical manipulations (normalizing, indexing, regressing, interpolating, etc) on either retrieved data from the applicable databases, or on user-input data (or a combination from each). Cross-file transferability of data exists through the ability to retrieve directly on record accession numbers. Close study of the Predicasts system documentation will repay searchers ready to integrate this capability into their searching. Once again, use of vendor representative(s) is strongly recommended.

Search I. Problem: Find historical data for the expenditures of local and State governments on libraries. Compare this data to population growth in the United States. From this retrieved data, derive a figure showing any change in per capita library expenditures by these agencies. Present this data in a suitable format for easy comparison.

STEP	ACTION	COMMENTARY
1	! 82	Begin file 82.
2	S PC 823	Select the Product Code for libraries (from PTS Code Thesaurus).

STEP	ACTION	COMMENTARY
3	S QC=POP	Select the Quick Code for U.S. Population. Use of a Quick Code automatically retrieves the relevant composite series.
4	/INTERVAL(1965 to 1977)	Computational System command. Selects a time range from the retrieved data, and creates a variable called YEARS that will be used in subsequent data manipulation.
5	/LIBRARIES=GET(1,5)	Computational System command. Creates a variable called LIBRARIES, the content of which is the fifth item from set 1 (Step 2).
6	/POPULATION=GET(2,1)	Computational System command. Creates a variable called POPULATION, the content of which is the first item from set 2 (Step 3).
7	/PERCAP=LIBRARIES/POPULATION	Computational System command. Creates a varaible called PERCAP, and defines it as the data retrieved from set 1 in the variable called LIBRARIES divided by the data retrieved from set 2 in the variable called POPULATION.
8	/TABULATE(YEARS, LIBRARIES, POPULATION, PERCAP)	Computational System command. Creates a tabular representation of the data represented by the specified variables. End of Search.

(see terminal printout in Appendix)

Search II. Problem: How does United States wine production compare with French wine production over the past fifteen to twenty years? Find data to answer this question, and present it in graphic form.

STEP	ACTION	COMMENTARY
1	! 84	Begin file 84.
2	S PC=208:001	Select the Product Code for wines.
3	S EC=62	Select the Event Code for production.
4	S CC=4FRA	Select the Country Code for France.

STEP	ACTION	COMMENTARY
5	Combine Steps 2*3*4	Combining the selected sets creates a set containing statistical information on French wine production.
6	/INTERVAL(1960 to 1977)	Computational System command. Selects a time range from the retrieved data, and creates a variable called YEARS that may be used in subsequent data manipulation.
7	/FPROD=GET(4,2)	Computational System command. Creates a variable called FPROD, the content of which is the second item from set 4 (Step 5).
8	/FINDEX=NORMALIZE(F-PROD:1967)	Computational System command. Creates a variable called FINDEX. The production data for French wine is in thousands (000's) of liters. As we will see below, the US production data is in millions of US gallons. Direct graphic comparison would not be possible if data were in different units. Therefore we create an index of French wine production which can be compared with a similar index of US production by normalizing the French data and using the year 1967 as the base year (i.e., production for that year will arbitrarily be set at 100).
9	! 82	Begin file 82.
10	S PC=2084001	Select the Product Code for wines.
11	S EC=62	Select the Event Code for production.
12	Combine Steps 10*11	Combining the selected sets creates a set containing statistical information on US wine production.
13	/INTERVAL(1964 to 1979)	(see Step 6 above)
14	/USPROD=GET(3,1)	Computational System command. Creates a variable called USPROD, the content of which is the first item from set 3 (Step 12).
15	/USINDEX=NORMAL-IZE(USPROD:1967)	Computational System command. Creates a variable called USINDEX, the structure and purpose of which are similar to those of FINDEX above.

STEP	ACTION	COMMENTARY
16	/TITLE="US AND FRENCH WINE PRODUCTION COMPARED"	Computational System command. Creates a heading for any subsequently developed graphic representations of data.
17	/GRAPH(USINDEX,FINDEX)	Computational System command. Creates a graphic representation of the data contained in the specified variables. Note that cross-file comparisons of data are possible by referencing the variable name of data retrieved in files other than that in which final presentation of the data is made (cf FINDEX). End of Search.

(see terminal printout in Appendix)

NOTES

1. A partial list of currently available, vendor-supplied NBDBS would include the following, by subject area:

Bus/Econ.	Educ.	Foundtn.	Gen'l.
Disclosure	NICEM	Foundn. Dir.	Encyc. Assns.
EIS Manuf'g Plants	US Pub Sch Dir.	Foundn. Grnts.	Votes (SDC)
EIS Nonmanuf'g	NICSEM/NIMIS**	Grants (SDC)	
Foreign Traders	Spec. Ed.**	Nat'l. Foundns.	
Frost & Sullivan			
Laborstats			
Predicasts (4)			
S & P News			
Trade Opportn			
US Exports			

All files are from Lockheed unless otherwise specified.
** partially nonbibliographical

2. Chemical Industry Notes
   F&S Indexes
   Federal Index
   Promt
   US Forecasts
   US Basebook
   Internat'l Forecasts
   Internat'l Basebook

APPENDIX:

TERMINAL PRINTOUTS

```
File100:DISCLOSURE - 79-81/Wk23
(Copr. DISCLOSURE Inc.)
Reports: (800-638-8241)
          Set Items Description

? s st=ca
            1 1542 ST=CA
? s environmental/pr
            2   732 ENVIRONMENTAL/PR
? cl*?
            3    50 1*2
? limit 3/maj
            4    25 3/MAJ
? .sort 4/1-25/co
            5    25 4/1-25/CO
0825499 PROFILE LAST FILED:   /   /    CO NO: A095000000
  ADDRESSOGRAPH MULTIGRAPH CORP
  1900 AVENUE OF THE STARS
  LOS ANGELES  CA  90067

10/7/2
0824499 PROFILE LAST FILED: 81/01/31 CO NO: A112500000
  ADVANCED CHEMICAL TECHNOLOGY
  1100 SOUTH AZUSA AVENUE
  INDUSTRY CA  91748

10/7/3
0806799 PROFILE LAST FILED:  74/12/20 CO NO: A380625000
  AMCORD INC
  610 NEWPORT CENTER DRIVE
  NEWPORT BEACH CA 92663

10/7/4
0732099 PROFILE LAST FILED: 81/03/31 CO NO: B689950000
  BP PIPELINES INC
  100 PINE STREET
  SAN FRANCISCO CA 94111

10/7/5
0716299 PROFILE LAST FILED: 77/12/31 CO NO: C035000000
  CALIFORNIA PACIFIC UTILITIES CO
  600 STOCKTON STREET
  SAN FRANCISCO  CA 94108

10/7/6
0648799 PROFILE LAST FILED: 77/12/31 CO NO: C713300000
  CONTINENTAL AIR LINES INC
  LOS ANGELES INTERNATIONAL AIPORT
  LOS ANGELES CA 90009

10/7/7
0635499  PROFILE LAST FILED: 81/03/31 CO NO: C847000000
  CROWN ZELLERBACH CORP
  ONE BUSH STREET
  SAN FRANCISCO CA 94104
```

```
? s st=ca
            1   1542  ST=CA
? s em=000000500: em=999999999
            2   6592 EM=000000500:EM=999999999
? c1*2
            3    642 1*2
? limit 3/maj
            4    321  3/MAJ
? .sort 4/1-321/zp/co
            5    321  4/1-32 /ZP/CO
? +5/7/1-20
5/7/1
0091099  PROFILE LAST FILED: 81/01/04 CO NO: T480000000
  THRIFTMART INC
  1837 SOUTH VERMONT AVENUE
  LOS ANGELES CA 90006

5/7/2
0648799 PROFILE LAST FILED: 81/02/20 CO NO:C713300000
  CONTINENTAL AIR LINES INC
 LOS ANGELES INTERNATIONAL AIRPORT
  LOS ANGELES CA 90009

5/7/3
0746399 PROFILE LAST FILED: 81/03/31
  BENEFICIAL STANDARD CORP
  3700 WILSHIRE BOULEVARD
  LOS ANGELES CA 90010

5/7/4
0566399 PROFILE LAST  FILED: 81/03/31 CO NO:F126900000
  FARMERS GROUP INC
  4680 WILSHIRE BOULEVARD
  LOS ANGELES CA 90010

5/7/5
0509099 PROFILE LAST FILED: 81/03/31 CO NO:G389300000
  GETTY OIL CO
  3810 WILSHIRE BOULEVARD
  LOS ANGELES CA 90010

5/7/6
0487499 PROFILE LAST FILED: 81/03/31 CO NO: H012650000
  H F AHMANSON & CO
  3731 WILSHIRE BOULEVARD
  LOS ANGELES CA 90010

5/7/7
0371999 PROFILE LAST FILED: 81/03/31 CO NO: M030250000
  MACRODYNE INDUSTRIES INC
  4465 WILSHIRE BLVD, SUITE 303
  LOS ANGELES CA 90010

5/7/8
0401599 PROFILE  LAST FILED: 81/03/31 CO NO: K832000000
  KNUDSEN CORP
  231 EAST 23RD STREET
  LOS ANGELES CA 90011
```

```
5/7/9
0748599 PROFILE LAST FILED: 81/03/31 CO NO: B311400000
  BEKINS CO
  1335 SOUTH FIGUEROA STREET
  LOS ANGELES CA 90015


FILE22: EIS Plants - Mar 81 81 Data (Types $0.50 each)
(Copr. EIS Inc.)
        Set Items Description
? e pn=california  sacramento
Ref Items Index-term
E1      8 CN-CALIFORNIA, NEVADA
            (CC=1906057)
E2   1068 CN=CALIFORNIA, ORANGE
            (CC=1906059)
E3     12 CN=CALIFORNIA, PLACER
            (CC=1906061)
E4      5 CN=CALIFORNIA, PLUMAS
            (CC=1906063)
E5    166 CN=CALIFORNIA, RIVERSIDE
            (CC=1906065)
E6    119 CN=CALIFORNIA, SACRAMENT
            (CC=1906067)
E7     10 CN=CALIFORNIA, SAN
           BENITO   (CC=1906069)
E8    227 CN=CALIFORNIA, SAN BERNA
           RDINO   (CC=1906071)
E9    419 CN=CALIFORNIA, SAN
           DIEGO   (CC=1906073)
E10   668 CN=CALIFORNIA, SAN FRANC
           ISCO   (CC=1906075)
                                    -more-
? ss cn=california, sacramento or cn=california, yolo
          1    119 CN=CALIFORNIA, SACRAMENTO  (CC=1906067)
          2     39 CN=CALIFORNIA, YOLO   (CC=1906113)
          3    158  1 OR 2
? e ex=
Ref Items  Index-term
E1     40  CN=WYOMING, SWEETWATER
            (CC=1856037)
E2      6  CN=WYOMING, TETON
            (CC=1856039)
E3      9  CN=WYOMING, UNITA
            (CC=1856041)
E4     13  CN=WYOMING, WASHAKIE
            (CC=1856043)
E5     20  CN=WYOMING, WESTON
            (CC=1856045)
E6        -EX=
E7  75051  EX=2   (20-49)
E8  32875  EX=3   (50-99)
E9  26414  EX=4   (100-249)
E10 10276  EX=5   (250-499)
E11  4376  EX=6   (500-999)
E12  1854  EX=7   (1000-2499)
E13   552  EX=8   (2500-9999)
E14    31  EX=9   (10000 AND OVER)
E15     2  HC=ABBEYVILLE
                                    -more-
? p
Ref Items  Index-term
E16     8  HC=ABEROEEN
E17    25  HC=ABILENE
```

```
E18     8  HC=ACTON
E19     2  HC=ACUSHNET
E20     3  HC=ACWORTH
E21
$ s e9-e14
          4 43503 E9-E14

Y e sd=
Ref Items  Index-term
E1     85  PN=WOOL YARN MILLS
             (PC=2283)
E2     52  PN=WOVEN CARPETS AND
             RUGS  (PC=2271)
E3    108  PN=X-RAY APPARATUS &
             TUBES (PC=3693)
E4    372  PN=YARN MILLS, EXCEPT
             WOOL (PC=2281)
E5      2  PN=YARN MILLS, EXCEPT
             WOOL (PC=22811)
E6        -SD=
E7      4  SD=00.2
E8     34  SD=00.3
E9    137  SB=00.4
E10  1204  SD=00.5
E11  1413  SD=00.6
E12  2191  SD=00.7
E13  3356  SD=00.8
E14  3995  SD=00.9
E15 38877  SD=01.0
                                    --more-
? P
Ref Items  Index-term
E16 23829  SD=02.0
E17 14056  SD=03.0
E18  9123  SD=04.0
E19  6818  SD=05.0
E20  5698  SD=06.0
E21  5444  SD=07.0
E22  3630  SD=08.0
E23  2961  SD=09.0
E24 14751  SD=10.0
E25  5194  SD=20.0
E26  2540  SD=30.0
E27  1401  SD=40.0
E28   878  SD=50.0
E29   648  SD=60.0
E30   527  SD=70.0
E31   394  SD=80.0
E32   282  SD=90.0
E33  2024  SD=99.0
E34 58515  SF=COMPANY
E35  3941  SF=FOREIGN
                                    -more-
? S e15-e33
          5139095 E15-E33
                  F6:  SD=
? ds
Sat Items Description
  1   119 CN=CALIFORNIA, SACRAMENTO
```

```
  2    39 CN=CALIFORNIA, YOLO
  3   158  1 OR 2
  4 43503 E9-E14 EX=
  5139095 E15-E33 SD=
? c3*(4+5)
               144 3*(4+5)


? t7/5/1-10
7/5/1
053821
  JACK OWENS SERVICE CO INC
    1626 DEL DAYO DR
    CARMICHAEL, CALIFORNIA  95608
    COUNTY : SACRAMENTO
    916-991-3076

    1389    OIL AND GAS FIELD SERVICES NEC

    SALES MIL $ : 02.4      INDUSTRY % : 0.04
    EMPLOYMENT : 2 (20-49)

7/5/2
145332
  AMERICAN CRYSTAL SUGAR
    WILLOW AVE
    CLARKSBURG, CALIFORNIA  95612
    COUNTY : YOLO
    906-744-1711

    2063    BEET SUGAR

    SALES MIL $ : 094.6     INDUSTRY % : 0.818
    EMPLOYMENT : 6 (500-999)

  AMERICAN CRYSTAL SUGAR  00309 * PUBLIC
    101 NORTH THIRD ST
    MOORHEAD, MINNESOTA  56560  218-236-4400

7/5/3
078658
  HERINGER RANCHES INC
    BOX 56 RT 1
    COURTLAND, CALIFORNIA  95615
    COUNTY : SACRAMENTO
    916-775-1410

    2041  FLOUR & OTHER GRAIN MILL PRODUCST

    SALES MIL $ : 04.2      INDUSTRY % : 0.10
    EMPLOYMENT : 2 (20-49)

7/5/4
011611
  HUNT WESSON FOODS INC
    1111 COVELL BLVD/BOX 220
    DAVIS, CALIFORNIA  95616
    COUNTY : YOLO
```

```
    916-753-4071

    2033  CANNED FRUITS & VEGETABLES

    SALES MIL $ : 087.2      INDUSTRY % : 01.10
    EMPLOYMENT : & (1000-2499)

  NORTON SIMON INC  14601 * PUBLIC
    277 PARK AVE
    NEW YORK, NEW YORK  10017  212-832-1000


File92:EIS Nonmanufacturing -Mar81 81 Data (Types $0.50 each)
(Copr. EIS Inc.)
         Set Items Description
         --- ----- -----------
? s bs=california
           1 23701 BS=CALIFORNIA
? 3 pn=agricultur?
Ref Items  Index-term
E1     12  PN=ADMINISTRATION OF
             VETERANS AFFAIRS  (PC
E2   6713  PN=ADMINISTRATIVE
             OFFICE  (PC=9803)
E3    495  PN=ADVERTISING AGENCIES
             (PC=7311)
E4     46  PN=ADVERTISING, NEC
             (PC=7319)
E5      1  PN=AGENTS FOR LAUNDRIES
             & DRY CLEANRS  (PC
E6        -PN=AGRICULTUR?
E7     16  PN=AGRICULTURAL CREDIT
             INSTITUTIONS  (PC=6
E8      5  PN=AGRICULTURAL MARKETIN
             G REGULATION (PC=
E9    503  PN=AGRICULTURAL PRODUCTI
             ON-CROPS  (PC=0100
E10   308  PN=AGRICULTURAL PRODUCTI
             ON-LIVESTOCK  (PC=0
                                  -more-

? p
Ref Items  Index-term
E11    60  PN=AIR, WATER, SOLID
             WASTE MANAGEMENT  (PC
E12    28  PN=AIRPORT TERMINAL
             SERVICES  (PC=4583)
E13   170  PN=AIRPORTS AND FLYING
             FIELDS  (PC=4582)
E14    53  PN=AIRPORTS AND FLYING
? s e9-e10
           2   811 E9-E10
                 E6: PN=AGRICULTUR?
? ci*2
           3   150 1*2
? .sort 3/1-150/sm,d/bn
           150 3/1-150/SM,D/BN
? t4/511-20
```

4/5/1
385990
ROCKVIEW DAIRIES INC
7011 STEWART-GRAY RD
DOWNET, CALIFORNIA 90241
COUNTY : LOS ANGELES
213-773-4771

0200 AGRICULTURAL PRODUCTION-LIVESTCK

SALES MIL $: 010.9 INDUSTRY % : 01.26
EMPLOYMENT : 4 (100-249)

4/5/2
386816
GIUMARRA VINEYARDS CORP
P O BIN 1969
BAKERSFIELD, CALIFORNIA 93303
COUNTY : KERN
805-366-5511

0100 AGRICULTURAL PRODUCTION-CROPS

SALES MIL $: 09.3 INDUSTRY % : 0.96
EMPLOYMENT : 4 (100-249)

GIUMARRA VINEYARDS CORP 28864
P O BIN 1969
BAKERSFIELD, CALIFORNIA 93303 805-366-5511

4/5/3
386942
GROWERS EXCHANGE INC
740 AIRPORT BLVD
SALINAS, CALIFORNIA 93901
COUNTY : MONTEREY
408-424-1884

0100 AGRICULTURAL PRODUCTION-CROPS

SALES MIL $: 09.3 INDUSTRY % : 0.96
EMPLOYMENT : 4 (100-249)

4/5/5
386540
JOE MAGGIO INC
275 WALNUT
HOLTVILLE, CALIFORNIA 92250
COUNTY: IMPERIAL
714-356-4567

0100 AGRICULTURAL PRODUCTION-CROPS

SALES MIL $: 09.3 INDUSTRY % : 0.96
EMPLOYMENT : 4 (100-249)

```
File82:PTS US Time Series - 81Anl/Qtr3
(Corr. PREDICASTS Inc.)
         Set Items Description
         --- ----- -----------
? s pc=823
           1     7 PC=823
? s qc=pqp
           2     1 QC=PQP
? +1/5/5
1/5/5
245233 GFS 80/08/00 P12   United States
  Libraries. expend by. state & local govt (FY)

             YEAR    MIL $

             1965     444.
             1966     486.
             1967     518.
             1968     573.
             1969     634.
             1970     700.
             1971     761.
             1972     814.
             1973     877.
             1974     968.
             1975    1119.
             1976    1249.
             1977    1259.
             1978    1362.
             1979    1504.

  GROWTH RATE= 9.1%
  CC=1USA   PC=8230000 EC=697

? /interval(1965 to 1979)
INPUT...INTERVAL (1965 to 1979)
? /libraries=get (1.5)
INPUT...LIBRARIES=GET (1.5)
245233 Libraries. expend by. state & local govt (FY)
? / population=get (2.1)
INPUT...POPULATION=GET (2.1)
799004 Population.
? /percap=libraries/population
INPUT...PERCAP=LIBRARIES/POPULATION
? /tabulate (years, libraries, population, percap)
INPUT...TABULATE (YEARS, LIBRARIES, POPULATION, PERCAP)

YEARS  LIBRARIE  POPULATI  PERCAP
*****  ********  ********  ******
 1965     444      194.3    2.2851
 1966     486      196.56   2.4725
 1967     513      198.71   2.6068
 1968     573      200.71   2.8549
 1969     634      202.58   3.1281
 1970     700      204.88   3.4167
 1971     761      207.05   3.6754
 1972     814      208.85   3.8976
 1973     877      210.41   4.1681
 1974     968      211.9    4.5682
 1975    1119      213.56   5.2398
```

1976	1249	215.15	5.8052
1977	1259	216.88	5.8051
1978	1362	218.72	6.2272
1979	1504	220.58	6.8183

File84:PTS International Time Series - 1981
(Copr. PREDICASTS Inc.)

	Set	Items	Description
? s pc=2084001			
	1	201	PC=2084001 (PN=WINE)
? s ec=62			
	2	47644	EC=62
? s cc=4fra			
	3	4409	CC=4FRA (CN=FRANCE)
? c1*2*3*			
	4	2	1*2*3

? +4/5/1-2
4/5/1
528751 FAO As 78/00/00 France
Wine. production.

YEAR	000 liters
1965	6238.
1966	6225.
1967	6203.
1968	6646.
1969	5123.
1970	7540.
1971	6225.
1972	5947.
1973	8347.
1974	7643.
1975	6697.
1976	7415.
1977	5256.
1978	5882.

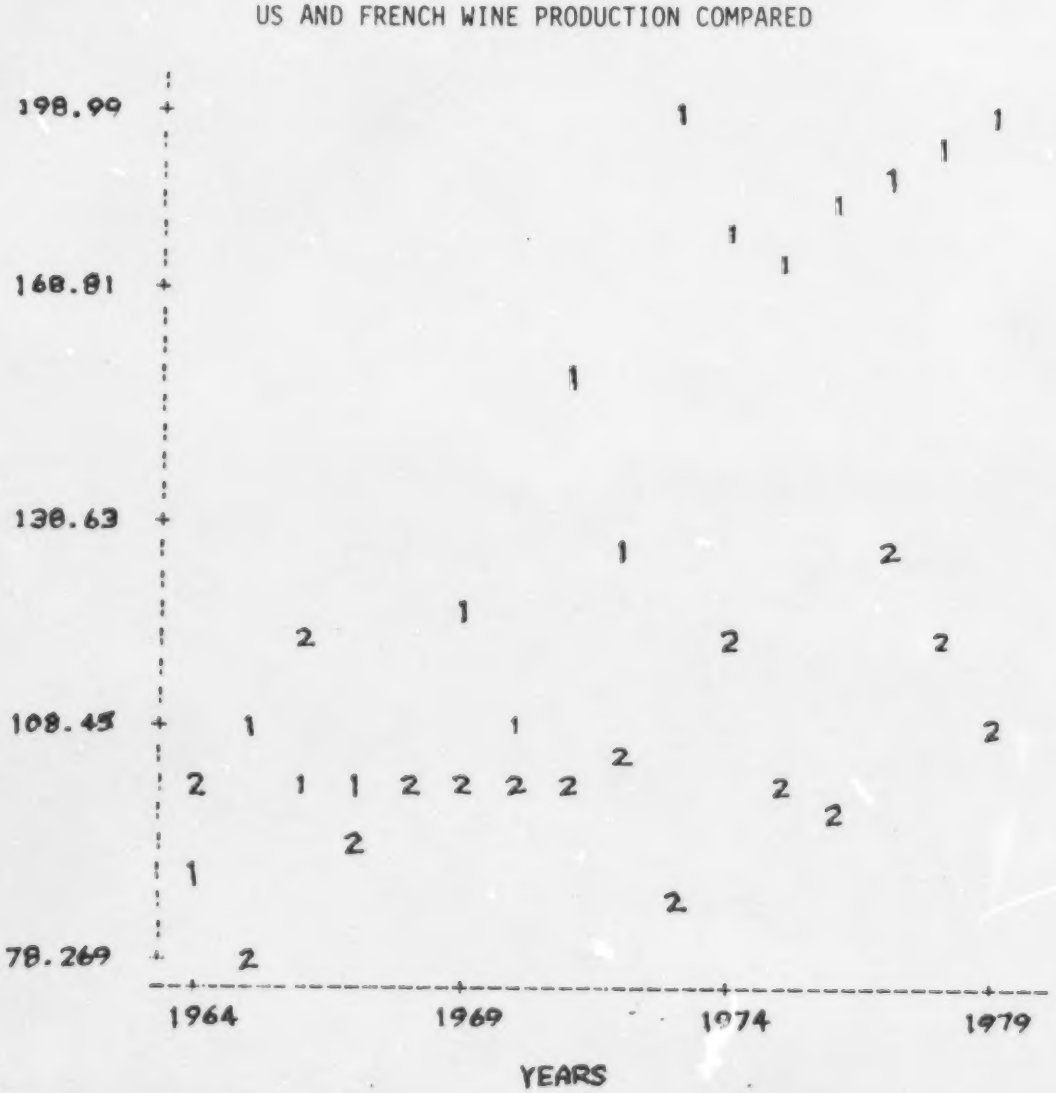
GROWTH RATE= 0.0%
CC=4FRA PC=2084001 EC=622

4/5/2
278925 Ind Stat 79/00/00 P157 France
Wine. production.

YEAR	MIL liters
1960	6311.
1961	4855.
1962	7497.
1963	5752.
1964	6243.
1965	6238.
1966	6225.
1967	6203.

```
                1968        6646.
                1969        5129.
                1970        7540.
                1971        6224.
                1972        5947.
                1973        8347.
                1974        7643.
                1975        6697.
                1976        7414.
                1977        5302.

  GROWTH RATE= 0.3%
  CC=4FRA   PC=2084001   EC=622

? /interval1(1960 to 1977)
INPUT...INTERVALL(1960 to 1977)
? /fprod=get(4.2)
INPUT...FPROD=GET(4.2)
278925 Wine. production.  .
? /findex=normalize(fprod:1969)
INPUT...FINDEX=NORMALIZE(FPROD:1967)
(Copr. PREDICASTS Inc.)
        Set Items Description
        --- ----- -----------
? S pc=2084001
          1    17 PC=2084001   (PN=WINE)
? s ec=62
          2  3205 EC=62
? c1*2
          3     1 1*2
? t3/5/1
3/5/1
250241  Wine Hdbk  80/00/00  P100    United States
  Wine.  production.  .

              YEAR    MIL wine gal

              1964      214.2
              1965      257.1
              1966      239.1
              1967      237.1
              1968      243.7
              1969      301.0
              1970      263.9
              1971      279.9
              1972      320.2
              1973      463.3
              1974      429.3
              1975      419.9
              1976      441.7
              1977      447.9
              1978      452.5
              1979      471.8

  GROWTH RATE= 5.2%
  CC=1USA   PC=2084001   EC=622
```

```
? /interval(1964 to 1979)
INPUT...ITNERVAL(1964 TO 1979)
? /usprod=get(3.1)
INPUT...USPROD=GET(3.1)
250241 Wine. production.  .
? /usindex=normalize(useprod:1967)
INPUT...USINDEX=NORMALIZE(USPROD:1967)

? /title="us and french wine production compared"
INPUT...TITLE-"US AND FRENCH WINE PRODUCTION COMPARED"
? /graph(usindex,findex)
INPUT...GRAPH(USINDEX,FINDEX)
```



1 = USINDEX
2 = FINDEX

Toxicology Data Bank

and

Registry of Toxic Effects of

Chemical Substances

Peter J. Vigil
Health Sciences Library
University of California, Davis

Two key nonbibliographic databases for toxicologic information are the Toxicology Data Bank (TDB) and the Registry of Toxic Effects of Chemical Substances (RTECS). Both databases are available through the National Library of Medicine's (NLM) MEDLARS (Medical Literature Analysis and Retrieval System). RTECS is also available through the NIH/EPA Chemical Information System (CIS).

RTECS is produced by the National Institute for Occupational Safety and Health (NIOSH) and TDB is produced by the National Library of Medicine. The RTECS and TDB databases consist of unit records organized by fields. The systems can thus be utilized in a data retrieval or information retrieval context, i.e., a unit record or records may be retrieved on a specific chemical or chemicals, or data by field may be manipulated to address a specific need, e.g. teratogenic, natural product, etc.

The two databases differ significantly in their scope and coverage. TDB has fewer records, approximately 4000 chemicals, but provides comprehensive information. RTECS on the other hand has a far greater number of records, approximately 50,000 but provides much less information than TDB.

TDB covers everything from antidote and treatment to manufacturers and production volumes. The TDB record consists of sections, including: Descriptive Profile, Values (toxic), Pharmacology/Toxicology, Environmental Information, Manufacturing Data and Chemical-Physical Properties. Records in TDB are identified as having been critically evaluated by a scientific review group for inclusion in the database.

The RTECS record is limited to description of the chemical, e.g., synonyms, CAS number, molecular weight; toxicity values; and regulation standards or status. The RTECS record is organized in three sections: Chemical Identification Data, Toxicity Data and Sources, and Standards, Regulations, and Additional Toxicological Data. Data in RTECS have not been critically evaluated for inclusion in the database.

Samples of the TDB and RTECS unit records are shown in example 1 and example 2 (search examples are at the end of this section). Example one illustrates the comprehensive overview that may be obtained on a specific chemical substance contained in TDB. Although there is not the same depth of coverage in RTECS, the NIOSH list nonetheless, does provide key information on the toxicity of its entries (example 2).

References from which the data are obtained in TDB and RTECS are provided and therefore might be an efficient means of starting a literature review. In either case, TDB or RTECS, a computer search of additional files, e.g., TOXLINE, is usually appropriate, particularly for updating. Conversely, when a computer search is requested the addition of a TDB or RTECS printout can be quite helpful in providing to the researcher additional information on the substance.

The fields of both files are searchable and thus there are many access points such as chemical name, synonym, name fragments, formula, etc. However Chemical Abstracts Registry number provides a precise means of retrieving a specific chemical. The registry numbers are readily

available from the various online chemical dictionaries. In example 1 the TDB record on malathion is retrieved using name, registry number or formula. It is also possible to retrieve the RTECS record using name, registry number or formula.

RTECS is also available in a hard copy version which is published by NIOSH. TDB is only available online. Documentation on these files is available in the NLM's ONLINE SERVICES REFERENCE MANUAL, 1980. The manual may be purchased from the U.S. National Technical Information Service.

Examples 1 and 2 illustrate the databases in the context of data retrieval systems, that is retrieval of a unit record corresponding to a specific chemical substance. However, these files may also be interrogated to identify groups or sets of chemicals with specified characteristics in common. The following problems demonstrate the information retrieval capability of RTECS and TDB. (The corresponding search examples are located at the end of this section).

Three problems are given first for RTECS then 3 problems for TDB. In the corresponding search examples field qualifiers are used in each search. A note is placed after each of the following problems briefly explaining the strategy and the fields used for searching. The problems and examples demonstrate the various means of accessing information as well as the selected output possible.

SAMPLE PROBLEMS:

REGISTRY OF THE TOXIC EFFECTS OF CHEMICAL SUBSTANCES (RTECS)

Problem 3 (RTECS)

Produce a list of organometallic agricultural chemicals for which NIOSH has produced Criteria Documents.

Note: The Category Code (cc) for organometallic and agricultural chemical are matched, then crossed with the text words to indicate Criteria Document, i.e., (tw) crit and doc (5 names printed.)

Problem 4

Provide a list of natural products which are teratogenic.

Note: The Category Code (cc) for natural product is matched with index term (ix) teratogenic (5 names printed).

Problem 5

Produce a list of sulfur containing substances which have an aquatic toxicity rating and have proposed or recommended standards by the Department of Transportation.

Note: Formula Fragment (ff) S for sulfur, is matched with text words

(tw) aquatic and toxicity and rating. This set is then matched with the (tw) DOT signifying Department of Transportation (5 names printed).

TOXICOLOGY DATA BANK (TDB)

Problem 6 (TDB)

Produce a list of carcinogenic laboratory chemicals. Print Pharmacology/Toxicology and Manufacturing Information sections (first record only).

Note: Truncated term lab: from the Manufacturing Information field (manf) is matched against the truncated term carcino: from the Pharmacology/Toxicology field (phtx). Pharmacology/Toxicology and Manufacturing Information data are printed only, i.e., print phts, mans. Indented provides full spelling of the type of information listed.

Problem 7 (TDB)

Produce a list of lethal chemicals transported by rail. Print manufacturing and environmental information, and print the poisoning potential.

Note: Truncated term rail: from the Environmental Information field (envr) is matched with the terms fatal or lethal from the Pharmacology/Toxicology (phtx) field. Manufacturing and Environmental Information sections are printed. Rather than printing the entire Pharmacology/Toxicology section, only the poisoning potential (ppot) is printed (first record only).

Problem 8.

Produce a list of organophosphate pesticides whose route of exposure is via inhalation. Print one record showing absorption, distribution, excretion and antidote and treatment.

Note: The truncated term pesticide: from the Manufacturing Information (manf) field is matched against inhalation from the Pharmacology/Toxicology (phtx) field. This set is matched against formula fragment (ff) P for phosphorus. The adsorption, distribution, and excretion (ade) and antidote and treatment (antr) information are printed for the first record.

Summary

The examples provided, illustrate to a limited degree the versatility and utilitarian value of TDB and RTECS. Creative and sophisticated information retrieval of these files may require an intimate knowledge of the problem to be solved. Thus end-user education is a key factor to utilize the system in this manner or an expert searcher-analyst who can identify an information retrieval application with a given problem.

SEARCH EXAMPLES

EXAMPLE 1: TDB UNIT RECORD

```
file tdb

PROG:
YOU ARE NOW CONNECTED TO THE TOXICOLOGY DATA BANK FILE.

SS 1 /C?
USER:
malathion

PROG:
MM (MALATHION) (7)
                1  MALATHION (NF)
                2  MALATHION (SY)
                3  MALATHION (EX)
                4  MALATHION (IX)
                5  MALATHION (PHTX)
                6  MALATHION (MANF)
                7  MALATHION (ENVR)
SPECIFY NUMBERS, ALL, OR, NONE-

USER:
2

PROG:
SS (1) PSTG (1)

SS 2 /C?
USER:
121-75-5

PROG:
SS (2) PSTG (1)

SS 3 /C?
USER:
c10-h19-o6-p-s2

PROG:
SS (3) PSTG (1)

SS 4 /C?
USER:
1 or 2 or 3

PROG:
SS (4) PSTG (1)

SS 5 /C?
USER:
```

EXAMPLE 1: TDB (Continued)

```
print detailed, complete, indented

PROG:

NAME OF SUBSTANCE          MALATHION
MOLECULAR FORMULA          C10-H19-O6-P-S2
CAS REGISTRY NUMBER        121-75-5
TDB NUMBER                 0665
MOLECULAR WEIGHT           330.36
WISWESSER LINE NOTATION    2OV1YVO2&SPS&O1&O1
SYNONYMS                   BUTANEDIOIC ACID,
                           ((DIMETHOXYPHOSPHINOTHIOYL)THIO)-, DIETHYL
                           ESTER
SYNONYMS                   SUCCINIC ACID, MERCAPTO-, DIETHYL ESTER,
                           S-ESTER WITH O,O-DIMETHYL PHOSPHORODITHIOATE
SYNONYMS                   AMERICAN CYANAMID 4,049
SYNONYMS                   S-(1,2-BIS(ETHOXYCARBONYL)ETHYL, O,O-DIMETHYL
                           PHOSPHORODITHIOATE
SYNONYMS                   S-1,2-BIS(ETHOXYCARBONYL)ETHYL-O,O-DIMETHYL
                           THIOPHOSPHATE
SYNONYMS                   CARBETOX
SYNONYMS                   CARBOPHOS
SYNONYMS                   COMPOUND 4049
SYNONYMS                   CYTHION
SYNONYMS                   DICARBOETHOXYETHYL O,O-DIMETHYL
                           PHOSPHORODITHIOATE
SYNONYMS                   S-(1,2-DI(ETHOXYCARBONYL)ETHYL DIMETHYL
                           PHOSPHOROTHIOLOTHIONATE
SYNONYMS                   DIETHYL MERCAPTOSUCCINATE, O,O-DIMETHYL
                           DITHIOPHOSPHATE, S-ESTER
SYNONYMS                   DIETHYL MERCAPTOSUCCINATE, O,O-DIMETHYL
                           PHOSPHORODITHIOATE
SYNONYMS                   DIETHYL MERCAPTOSUCCINATE, O,O-DIMETHYL
                           THIOPHOSPHATE
SYNONYMS                   O,O-DIMETHYL
                           S-(1,2-BIS(ETHOXYCARBONYL)ETHYL)DITHIOPHOSPHA-
                           TE
SYNONYMS                   O,O-DIMETHYL-S-(1,2-DICARBETHOXYETHYL)
                           DITHIOPHOSPHATE
SYNONYMS                   O,O-DIMETHYL
                           S-(1,2-DICARBETHOXYETHYL)PHOSPHORODITHIOATE
SYNONYMS                   O,O-DIMETHYL S-(1,2-DICARBETHOXYETHYL)
                           THIOTHIONOPHOSPHATE
SYNONYMS                   O,O-DIMETHYL S-1,2-DI(ETHOXYCARBAMYL)ETHYL
                           PHOSPHORODITHIOATE
SYNONYMS                   O,O-DIMETHYLDITHIOPHOSPHATE
                           DIETHYLMERCAPTOSUCCINATE
SYNONYMS                   ENT 17,034
SYNONYMS                   ETHIOLACAR
SYNONYMS                   FOSFOTHION
SYNONYMS                   FOSFOTION
SYNONYMS                   FOUR THOUSAND FORTY-NINE
SYNONYMS                   INSECTICIDE NO 4049
SYNONYMS                   KARBOFOS
SYNONYMS                   MALAMAR 50
SYNONYMS                   MALATHION LV CONCENTRATE
SYNONYMS                   MALATHON
SYNONYMS                   MERCAPTOTHION
SYNONYMS                   OLEOPHOSPHOTHION
SYNONYMS                   PHOSPHORODITHIOIC ACID, O,O-DIMETHYL ESTER,
                           S-ESTER WITH DIETHYL MERCAPTOSUCCINATE
SYNONYMS                   PHOSPHOTHION
```

EXAMPLE 1: TDB (Continued)

```
SYNONYMS                SADOFOS
SYNONYMS                SADOPHOS
SYNONYMS                SF 60
SYNONYMS                SIPTOX 1
SYNONYMS                MALATOX
SYNONYMS                CHEMATHION
SYNONYMS                MALAGRAN
SYNONYMS                KYPFOS
SYNONYMS                MALAKILL
SYNONYMS                MALPHOS
SYNONYMS                MALACIDE
SYNONYMS                EMMATOS
SYNONYMS                EMMATOS EXTRA
SYNONYMS                FORMAL
SYNONYMS                FYFANON
SYNONYMS                KOP-THION
SYNONYMS                MALASPRAY
SYNONYMS                MALAMAR
SYNONYMS                MLT
SYNONYMS                ZITHIOL
MAJOR USE               MERCK INDEX 9TH ED 740 INSECTICIDE
MAJOR USE               MERCK INDEX 9TH ED 740 VET: ECTOPARASITICIDE
MAJOR USE               SRI INSECTICIDE USED ON AGRICULTURAL CROPS
                        AND LIVESTOCK
MELTING POINT           2.9 DEG C
BOILING POINT           156-157 DEG C AT 0.7 MM HG
DENSITY/SPEC GRAVITY    1.23 AT 25 DEG C/4 DEG C
FLASH POINT             ABOVE 325 DEG F OC
THERAPEUTIC USES        HAYES, TOX OF PESTICIDES 1975 227 PESTICIDES
                        APPLIED DERMALLY TO MAN TO CONTROL BACTERIA,
                        INSECTS, OR OTHER PARASITES ON SURFACE
                        INCLUDE...MALATHION...
THERAPEUTIC USES        AMA DRUG EVAL 3RD ED 879 MALATHION (1 %) CAN
                        BE USED FOR TREATING LOUSE INFESTATIONS
                        RESISTANT TO...GAMMA BENZENE HEXACHLORIDE &
                        CHLOROPHENOTHANE & IS ALTERNATIVE DRUG FOR
                        PEDICULOSIS CAPITIS (...0.5 %...) & PUBIS
                        (...0.5 % OR 1.0 %...).
THERAPEUTIC USES        OSOL. REMINGTON'S PHARM 15TH ED 832 DOSE: AS
                        1 % DUST /AS PEDICULOSIDE OR MITICIDE/.
WARNINGS/CAUTIONS       OSOL. REMINGTON'S PHARM 15TH ED 832
                        ...MARKETED AS PEDICULOSIDE & MITICIDE FOR
                        USE ON HUMAN, BUT IT IS UNDER REVIEW, &
                        FUTURE OF USE IS IN DOUBT.
CONTINUE PRINTING? (YES/NO)

USER:
yes

PROG:

ANTIDOTE & TREATMENT    GOSSELIN. CTCP 4TH ED II-194 SEE PARATHION.
                        TREATMENT: 1. ATROPINIZE PT IMMEDIATELY. IN
                        ADULT USUAL DOSE...1 TO 4 MG OF SULFATE (OR
                        OTHER SALT) GIVEN IM OR BETTER IV (IF THERE
                        IS NO CYANOSIS). MAINTENANCE OF FULL
                        ATROPINIZATION MAY REQUIRE 2 MG DOSES @
                        INTERVALS OF 15 TO 60 MIN FOR MANY HR.
                        /PARATHION/
ANTIDOTE & TREATMENT    GOSSELIN. CTCP 4TH ED II-194 SEE PARATHION.
                        TREATMENT: 1. /IF POSSIBLE, CORRECT CYANOSIS/
                        BEFORE ATROPINIZATION... 2. RELIEVE UPPER
                        AIRWAY OBSTRUCTION... MUCUS & OTHER RESP
                        TRACT SECRETIONS MAY HAVE TO BE ASPIRATED
                        CONTINUOUSLY. ENDOTRACHEAL INTUBATION OR
                        TRACHEOTOMY MAY BECOME NECESSARY...
```

EXAMPLE 1: TDB (Continued)

	/PARATHION/
ANTIDOTE & TREATMENT	GOSSELIN. CTCP 4TH ED II-194 SEE PARATHION. TREATMENT: 3. IN PRESENCE OF ESTABLISHED SYMPTOMS ADMIN PAM (2-PYRIDINE ALDOXIME METHOCHLORIDE, PRALIDOXIME CHLORIDE, PROTOPAM CHLORIDE). INITIAL ADULT DOSE...1 TO 2 G, PREFERABLY...IV INFUSION IN 100 ML SALINE OVER PERIOD...15 TO 30 MIN. /PARATHION/
ANTIDOTE & TREATMENT	GOSSELIN. CTCP 4TH ED II-194 SEE PARATHION. TREATMENT: 3. FOR MORE RAPID EFFECT /PAM/...CAN BE INJECTED IV AS 5 % SOLN IN WATER OVER PERIOD...NOT LESS THAN 5 MIN. IN CHILDREN INITIAL DOSE...20 TO 40 MG/KG. IF WEAKNESS PERSISTS...SECOND DOSE OF 1 TO 2 G MAY BE ADMIN AFTER 1 HR, AS INDICATED. /PARATHION/
ANTIDOTE & TREATMENT	GOSSELIN. CTCP 4TH ED II-194 SEE PARATHION. 4. GIVE OXYGEN & ARTIFICIAL RESPIRATION AS NEEDED... PULMONARY EDEMA MAY OCCUR... 5. GASTRIC LAVAGE WITH 5 % SODIUM BICARBONATE SOLN MAY BE WARRANTED AFTER INGESTION OF PARATHION, IF SPONTANEOUS VOMITING IS NOT PROMPT & PROFUSE. /PARATHION/
ANTIDOTE & TREATMENT	GOSSELIN. CTCP 4TH ED II-194 SEE PARATHION. TREATMENT: 6. WASH...CONTAMINATED AREA OF SKIN WITH SOAP & WATER OR...WITH 95 % ETHYL ALCOHOL... IRRIGATE EYES WITH WATER OR SALINE SOLN. 7. /ADMIN IV/ ISOTONIC SALINE TO CORRECT DEHYDRATION & ELECTROLYTE IMBALANCES. GIVE SODIUM BICARBONATE FOR METABOLIC ACIDOSIS. /PARATHION/
ANTIDOTE & TREATMENT	GOSSELIN. CTCP 4TH ED II-194 SEE PARATHION. TREATMENT: 8. NEVER GIVE THEOPHYLLINE, OR THEOPHYLLINE-ETHYLENEDIAMINE (AMINOPHYLLINE). AVOID CENTRAL DEPRESSANT DRUGS SUCH AS MORPHINE, BARBITURATES /INCL SHORT-ACTING ONES/, RESERPINE, PHENOTHIAZINES & OTHER TRANQUILIZERS... /PARATHION/
ANTIDOTE & TREATMENT	GOSSELIN. CTCP 4TH ED II-194 SEE PARATHION. TREATMENT: 9. KEEP PT UNDER CONSTANT OBSERVATION FOR PERIOD OF 24 TO 36 HR. SYMPTOMS MAY PERSISTS FOR MO... LAB /DIAGNOSIS/: 1. REPEATED BLOCK ANALYSIS FOR CHOLINESTERASE ACTIVITY... TISSUE LEVELS OF ORGANOPHOSPHATES... 2. ECG... /PARATHION/
ANTIDOTE & TREATMENT	RUMACK, POISINDEX 7: TREATMENT: IRRIGATE EYES & WASH CONTAMINATED AREAS OF BODY WITH SOAP & WATER.
ANTIDOTE & TREATMENT	GARNER'S VET TOX 3RD ED 257 VET: ONLY SPECIFIC ANTIDOTE TO POISONING...HAS BEEN ATROPINE. /ORGANOPHOSPHORUS INSECTICIDES/
VAPOR PRESSURE	4X10-4 MM HG AT 30 DEG C
COLOR/FORM	DEEP BROWN TO YELLOW LIQUID
COLOR/FORM	OILY LIQUID
STABILITY/SHELF LIFE	HYDROLYZED ABOVE PH 7.0 & BELOW 5.0
STABILITY/SHELF LIFE	STABLE IN AQ SOLUTION BUFFERED TO PH 5.26
SOLUBILITY	SLIGHTLY SOL IN WATER (145 PPM)
SOLUBILITY	MISCIBLE WITH ALCOHOLS, ESTERS, KETONES, ETHERS
SOLUBILITY	MISCIBLE WITH AROMATIC & ALKYLATED AROMATIC HYDROCARBONS
SOLUBILITY	MISCIBLE WITH VEGETABLE OILS
SOLUBILITY	LIMITED SOLUBILITY IN PARAFFIN HYDROCARBONS
SPECTRAL & OTHER PROPS	MERCK INDEX 9TH ED 740 CHARACTERISTIC ODOR
SPECTRAL & OTHER PROPS	MERCK INDEX 9TH ED 740 INDEX OF REFRACTION: 1.4985 AT 25 DEG C/D

EXAMPLE 1: TDB (Continued)

```
SPECTRAL & OTHER PROPS    WEAST. HDBK CHEM & PHYS 57TH ED C-677 SADTLER
                          REFERENCE NUMBER: 11587 (IR, PRISM)
SPECTRAL & OTHER PROPS    MERCK INDEX 9TH ED 740 PETROLEUM ETHER IS SOL
                          TO ABOUT 35% IN MALATHION
SPECTRAL & OTHER PROPS    WHITE-STEVENS. PEST IN ENVIRON VOL 1 96
                          TECHNICAL MATERIAL 95-98% PURE
SPECTRAL & OTHER PROPS    FARM CHEM HDBK 1977 D-160 GARLIC ODOR
TOXICITY VALUES           NIOSH. REG TOX EFFECT CHEM SUB 1977 876 LD50
                          RATS ORAL 1401 MG/KG
TOXICITY VALUES           NIOSH. REG TOX EFFECT CHEM SUB 1977 876 LD50
                          RATS INTRAPERITIONEAL 340 MG/KG
TOXICITY VALUES           NIOSH. REG TOX EFFECT CHEM SUB 1977 876 LD50
                          RATS PERCUTANEOUS 4444 MG/KG
TOXICITY VALUES           NIOSH. REG TOX EFFECT CHEM SUB 1977 876 LD50
                          MICE INTRAPERITONEAL 193 MG/KG
TOXICITY VALUES           NIOSH. REG TOX EFFECT CHEM SUB 1977 876 LDLO
                          RABBITS ORAL 1200 MG/KG
TOXICITY VALUES           NIOSH. REG TOX EFFECT CHEM SUB 1977 876 LD50
                          RABBITS PERCUTANEOUS 4100 MG/KG
TOXICITY VALUES           NIOSH. REG TOX EFFECT CHEM SUB 1977 876
                          AQUATIC TOXICITY: TLM: 1 TO UNDER 10 PPM/96
                          HR
CONTINUE PRINTING? (YES/NO)

USER:
yes

PROG:

TOXICITY VALUES           WHITE-STEVENS. PEST IN ENVIRON VOL 1 107 LD50
                          HOUSEFLIES PERCUTANEOUS 27.0 UG/G
TOXICITY VALUES           WHITE-STEVENS. PEST IN ENVIRON VOL 1 107 LC50
                          MOSQUITO LARVAE 0.081 PPM, CULEX
                          QUINQUEFACIATUS
MANUFACTURING INFO        MERCK INDEX 9TH ED 740 PREPN: JOHNSON ET AL,
                          J ECON ENTOMOL 45, 279 (1952); CASSADAY, US
                          PATENT 2,578,652 (1951 TO AM CYANAMID).
                          PURIFICATION: USUI, US PATENT 2,962,521 (1960
                          TO SUMITOMO).
MANUFACTURING INFO        MARTIN. PESTICIDE MANUAL 4TH ED 321 ...PREPD
                          BY ADDITION OF O,O-DIMETHYL PHOSPHORODITHIOIC
                          ACID TO DIETHYL MALEATE.
                          HYDROQUINONE...PRESENT TO SUPPRESS
                          POLYMERIZATION OF UNSATURATED ESTER.
MANUFACTURING INFO        NRC. DRINKING WATER & HEALTH 1977 620 ...ONE
                          OF EARLIEST ORGANOPHOSPHORUS
                          COMPD...DEVELOPED AS INSECTICIDE...REGISTERED
                          FOR USE ON MORE THAN 130 CROPS AGAINST WIDE
                          SPECTRUM OF INSECTS & MITES.
MANUFACTURING INFO        FARM CHEM HDBK 1977 D-160 MALATHION IS
                          GENERALLY COMPATIBLE WITH ALL INSECTICIDES &
                          FUNGICIDES IN COMMON USAGE. ...MIXED WITH
                          ALKALINE MATERIALS INITIAL KILLS ARE
                          SATISFACTORY BUT RESIDUAL TOXICITY MAY BE
                          REDUCED.
MANUFACTURING INFO        WHITE-STEVENS. PEST IN ENVIRON VOL 1 284
                          ...MALATHION /DETERMINED
                          SPECTROPHOTOMETRICALLY AT 418 NM/ RL BEARD, J
                          ECON ENTOMOL, 58, 584 (1965).
MANUFACTURING INFO        SPENCER. GUIDE TO CHEM IN CROP PROTECT 319
                          PRODUCT ANALYSIS: ...TITRATED WITH SODIUM
                          THIOSULFATE. LAKSHMINARAYANA, V, J AGR FOOD
                          CHEM, 14, 55, 1966. .../OTHER/ METHODS:
                          INFRARED SPECTROPHOTOMETRIC 11.0-13.0 U;
                          INFRARED METHOD FOR EMULSIFIABLE LIQ 12.2 U;
                          COLORIMETRIC... ...AT 420 NM. UPHAM, SD, J
```

EXAMPLE 1: TDB (Continued)

```
                        ASSOC OFF AGR CHEM, 43, 360, 1960.
MANUFACTURING INFO      MERCK INDEX 9TH ED 740 ...PARTICULARLY
                        EFFECTIVE AGAINST PEAR PSYLLA, RED SPIDER
                        MITES...APHIDS.
MANUFACTURING INFO      FARM CHEM HDBK 1977 D-160 ...CONTROLS WIDE
                        VARIETY OF INSECTS...APHIDS, SPIDER MITES,
                        SCALE INSECTS, HOUSE
                        FLY...MOSQUITOES...SUCKING & CHEWING INSECTS
                        ATTACKING FRUITS, VEGETABLES, ORNAMENTALS, &
                        STORED PRODUCTS.
MANUFACTURING INFO      FARM CHEM HDBK 1977 D-160
                        CYTHION...FYFANON...EMMATOS EXTRA IS LOW-ODOR
                        PRODUCT... IN US THIS IS ONLY GRADE
                        REGISTERED FOR USE ON STORED GRAIN...INSIDE
                        HOMES, & ACCEPTED FOR USE ON HUMANS.
MANUFACTURING INFO      FARM CHEM HDBK 1977 D-160 MALATHION ULV
                        CONCENTRATE CONTAINS 95 % O,O-DIMETHYL S-(1,2
                        DICARBETHOXYETHYL) PHOSPHORODITHIOATE...FOR
                        ULTRA-LOW VOL AERIAL APPLICATION TO ALFALFA,
                        CLOVER, PASTURE & RANGE GRASSES,
                        NONAGRICULTURAL LAND, CEREAL CROPS, COTTON,
                        SAFFLOWER, SOYBEANS, SUGAR BEETS, CORN,
                        BEANS, BLUEBERRIES...ALSO APPLIED TO BEEF
                        CATTLE.
MANUFACTURING INFO      FARM CHEM HDBK 1977 D-160 ITS USE...INDICATED
                        WHERE HIGH DEGREE OF SAFETY TO MAMMALS IS
                        DESIRED- TOLERANCE OF 135 PPM FOR FORAGE,
                        GRASS & GREEN HAY ALLOWS MALATHION TO BE
                        APPLIED ON SAME DAY AS GRAZED OR HARVESTED.
                        GENERALLY ESTABLISHED TOLERANCES ARE FOR
                        RESIDUES OF 8 PPM... THERE ARE SPECIALIZED
                        USES WITH HIGHER & LOWER TOLERANCES.
MANUFACTURING INFO      MENZIE. METAB PESTICIDES 1969 232 STUDIES
                        WITH OPTICALLY ACTIVE ISOMERS OF MALATHION &
                        MALAOXON SHOWED THAT D-ISOMER WAS MORE TOXIC
                        THAN L-ISOMER.
MANUFACTURING INFO      OSOL. REMINGTON'S PHARM 15TH ED 1191 WHEN
                        CHLORINATED HYDROCARBON RESISTANCE IS
                        ENCOUNTERED IN ROACHES, MALATHION AS 1.2 %
                        SPRAY HAS PROVED TO BE EFFECTIVE SUBSTITUTE.
SHIPMENT METHODS        NIOSH. REG TOX EFFECT CHEM SUB 1977 877
                        DOT-ORM-A, LABEL: NONE
POISONING POTENTIAL     GOSSELIN. CTCP 4TH ED II-194 ...APPROVED
                        (1955) FOR HOUSEHOLD USE. WITH
                        IMPROVED...METHODS PURITY...NOW EXCEEDS 99 %.
                        INCR IN PURITY HAS RESULTED IN...DECR IN
                        ACUTE TOXICITY...
POISONING POTENTIAL     GOSSELIN. CTCP 4TH ED II-194 TOXICITY RATING:
                        4. 4= VERY TOXIC. PROBABLE ORAL LETHAL DOSE
                        (HUMAN) 50-500 MG/KG, BETWEEN 1 TEASPOON & 1
                        OZ FOR 70 KG PERSON (150 LB).
POISONING POTENTIAL     NIOSH. REG TOX EFFECT CHEM SUB 1977 876 LDLO
                        HUMAN ORAL 50 MG/KG.
POISONING POTENTIAL     NRC. DRINKING WATER & HEALTH 1977 624
                        MUTAGENICITY- NO INFORMATION ON POSSIBLE
                        MUTAGENIC EFFECT...FOUND... CARCINOGENICITY-
                        NO INFORMATION ON POSSIBLE ONCOGENIC
                        EFFECTS...WAS FOUND...
POISONING POTENTIAL     FARM CHEM HDBK 1977 D-160 HARMFUL BY
                        SWALLOWING, INHALATION OR SKIN CONTACT. AVOID
                        BREATHING SPRAY MIST. AVOID CONTACT WITH
                        SKIN. ... CHANGE CONTAMINATED CLOTHING. DO
                        NOT CONTAMINATE FOOD OR FEED PRODUCTS.
POISONING POTENTIAL     OSOL. REMINGTON'S PHARM 15TH ED 832 ...60
                        G...ESTIMATED FATAL ORAL DOSE.
CONTINUE PRINTING? (YES/NO)
```

EXAMPLE 1: TDB (Continued)

USER: yes	
PROG:	
ENV/OCC EXP & LIMITS	NIOSH. REG TOX EFFECT CHEM SUB 1977 877 OSHA STD- AIR: TIME WEIGHTED AVG 15 MG/CU M (SKIN); OCCUPATIONAL EXPOSURE TO MALATHION RECOMMENDED STD- AIR: TIME WEIGHTED AVG 15 MG/CU M.
ENV/OCC EXP & LIMITS	NRC. DRINKING WATER & HEALTH 1977 626 ADI /AVG DAILY INTAKE IN DRINKING WATER/ WAS CALCULATED AT 0.02 MG/KG...
ENV/OCC EXP & LIMITS	WHITE-STEVENS. PEST IN ENVIRON VOL 1 110 ...GREAT CARE...EXERCISED...HANDLING CONCN MATERIALS... ...RUBBER GLOVES, GOGGLES, RESPIRATOR...PROTECTIVE CLOTHING IS ADVISABLE. ...MATERIAL SPILLED ON SKIN...IMMEDIATELY REMOVED WITH SOAP & WATER. ...CONTAMINATED CLOTHING SHOULD BE CHANGED... PERIODIC EST OF BLOOD CHOLINESTERASE...OF VALUE... /ORGANOPHOSPHORUS COMPD/
POLLUTION POTENTIAL	NRC. DRINKING WATER & HEALTH 1977 621 ...PERSISTENCE OF MALATHION...HALF-LIFE IN RAW RIVER WATER...LESS THAN 1 WK...STABLE IN DISTILLED WATER FOR 3 WK. ...DIFFERENCE MAY RESULT FROM BIOLOGIC ACTIVITY IN RAW RIVER WATER. ... ...DEGRADED...MORE RAPIDLY THAN OTHER ORGANOPHOSPHORUS INSECTICIDES... ...PRODUCTION OF METABOLITES & THEIR PERSISTENCE...UNINVESTIGATED.
POLLUTION POTENTIAL	MENZIE. METAB PESTICIDES 1969 231 UV IRRADIATION OF MALATHION DUST & EMULSIONS SHOWED LATTER TO BE LESS STABLE.
POLLUTION POTENTIAL	MENZIE. METAB PESTICIDES 1974 234 DEGRADATION...IN SOIL WAS RAPID...RELATED TO DEGREE OF ABSORPTION, SUGGESTING CHEMICAL MECHANISM. ... ...RATE OF...HYDROLYSIS INCR...ABOVE CRITICAL MOISTURE LEVEL. AT TEMP OF 70 DEG F & 90 DEG F, CRITICAL MOISTURE LEVEL WAS...11.6 % & 11.8 %, RESPECTIVELY.
DISPOSAL METHODS	RUMACK. POISINDEX 2. HAZARDS SPILLS: SHOULD BE COVERED WITH SODIUM HYDROXIDE OR SODIUM HYPOCHLORITE. ... 4. DISPOSAL: MIX WITH SODIUM HYDROXIDE & WATER THEN DISPOSE OF IN INCINERATOR OR SANITARY LAND FILL.
THRESHOLD LIMIT VALUE	THIENES. CLIN TOX 5TH ED 148 TLV: 10 MG/CU M SKIN
CLASS. BY MAJOR USE	SRI INSECTICIDE
U.S. PRODUCTION	SRI (1972) 1.1X10+10 GRAMS
U.S. PRODUCTION	SRI (1974) 7.26X10+9 GRAMS (CONSUMPTION)
U.S. IMPORTS	SRI (1972) 7.0X10+7 GRAMS
U.S. IMPORTS	SRI (1973) 2.77X10+7 GRAMS
U.S. EXPORTS	SRI (1972) 3.6X10+9 GRAMS
U.S. EXPORTS	SRI (1975) ND
U.S. METHOD OF MANUFACT	SRI FORMATION OF DIMETHYL PHOSPHORODITHIOIC ACID BY THE REACTION OF PHOSPHORUS PENTASULFIDE WITH METHANOL, FOLLOWED BY ADDITION OF DIETHYL MALEATE
CONSUMPTION PATTERN	SRI 31% FOR AGRICULTURAL CROPS AND LIVESTOCK; 31% FOR HOME AND GARDEN USE; 25% IN INDUSTRY AND COMMERCE; 13% BY GOVERNMENT AGENCIES (1972)
MANUFACTURERS	SRI AMERICAN CYANAMID CO, AGRICULTURAL DIV, LINDEN, NJ

EXAMPLE 1: TDB (Continued)

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ABSORP/DISTRIB/EXCRETE    GOODMAN. PHARM BASIS THERAP 5TH ED 455
                          ...RAPIDLY & EFFECTIVELY ABSORBED BY
                          PRACTICALLY ALL ROUTES...GI TRACT, AS WELL
                          AS...SKIN & MUCOUS MEMBRANES FOLLOWING
                          CONTACT WITH LIQUID...BY LUNGS AFTER
                          INHALATION OF VAPORS OR FINELY DISPERSED
                          DUSTS OR AEROSOLS.
ABSORP/DISTRIB/EXCRETE    GOODMAN. PHARM BASIS THERAP 5TH ED 455
                          ...MOST ORGANOPHOSPHORUS COMPD ARE EXCRETED
                          ALMOST ENTIRELY AS METABOLIC BREAKDOWN
                          PRODUCTS IN URINE. /ORGANOPHOSPHORUS
                          INSECTICIDES/
ABSORP/DISTRIB/EXCRETE    FOREIGN COMPD METAB IN MAMMALS VOL 1 78
                          EXCRETION OF (32)P /MALATHION/ AFTER ORAL
                          DOSE...TO LACTATING COW WAS LESS RAPID. 69
                          %...EXCRETED IN 4-DAY URINE, 8 % IN
                          FECES...0.2 % IN MILK. SINCE EXCRETION OF
                          (32)P WAS VERY SLOW...ITS INCORPORATION INTO
                          BODY TISSUES HAD PROBABLY OCCURRED...
ABSORP/DISTRIB/EXCRETE    FOREIGN COMPD METAB IN MAMMALS VOL 1 78
                          ...(14)C-MALATHION WAS ABSORBED & RAPIDLY
                          EXCRETED IN RATS. 8 HR AFTER ORAL DOSE, 44
                          %...(14)C...EXCRETED IN URINE & 47
                          %...REMAINED IN GI TRACT...AFTER 24 HR, 83
                          %...EXCRETED IN URINE, 6 % IN FECES, 3 % IN
                          EXPIRED AIR, & 8 % REMAINED IN GI TRACT.
ABSORP/DISTRIB/EXCRETE    FOREIGN COMPD METAB IN MAMMALS VOL 2 144
                          ...WHEN (14)C-MALATHION...WAS APPLIED /TO
                          HUMAN SKIN/. 7, 9, & 23 % WERE ABSORBED
                          THROUGH FOREARM, ABDOMEN, & FOREHEAD,
                          RESPECTIVELY.
ABSORP/DISTRIB/EXCRETE    NRC. DRINKING WATER & HEALTH 1977 621 AFTER
                          INGESTION BY MAMMALS, MALATHION IS RAPDILY
                          ABSORBED FROM DIGESTIVE SYSTEM.
                          DISTRIBUTION...GENERAL...VERY LOW
                          CONCN...FOUND IN MANY TISSUES. ...LIVER &
                          BONE...SOMEWHAT HIGHER THAN...OTHER TISSUES.
METABOLISM                GOSSELIN. CTCP 4TH ED II-194 LOW MAMMALIAN
                          TOXICITY OF MALATHION IS DUE...TO
                          ALI-ESTERASES THAT METABOLIZE MALATHION TO
                          INACTIVE PRODUCTS. SOME SPECIES HAVE
                          ALI-ESTERASES IN...PLASMA & LIVER...MAN
                          APPEARS TO POSSESS ONLY LATTER ENZYME.
CONTINUE PRINTING? (YES/NO)

USER:
yes

PROG:

METABOLISM                FOREIGN COMPD METAB IN MAMMALS VOL 1 78
                          HYDROLYSIS OF ORGANOPHOSPHORUS COMPD AT P-O &
                          P-S BONDS IN VIVO WILL...PRODUCE INORG
                          PHOSPHATE WHICH WILL BECOME INCORPORATED INTO
                          BODY TISSUES. /ORGANOPHOSPHORUS COMPD/
METABOLISM                PARKE. BIOCHEM COMPOUNDS 1968 204 SELECTIVE
                          TOXICITY TO INSECTS...ACCOUNTED FOR BY
                          DIFFERENCES IN METABOLISM. (32)P-MALATHION IS
                          RAPIDLY METABOLIZED IN MICE, RATS &
                          DOGS...TO...MONOESTER &...DIACID...IN INSECTS
                          OXIDN TO MALAOXON & CLEAVAGE OF PHOSPHATE
                          THIOESTER...TO...O,O-DIMETHYL-PHOSPHORODITHIO-
                          NATE & -PHOSPHOROTHIONATE... TOXICITY...DUE
                          TO...MALAOXON...
METABOLISM                PARKE. BIOCHEM COMPOUNDS 1968 204 TOXICITY
                          /TO INSECTS/ OF MALATHION IS PROBABLY DUE TO
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EXAMPLE 1: TDB (Continued)

	ITS OXIDATION TO MALAOXON, WHICH IS SOME 1000 TIMES MORE ACTIVE THAN MALATHION AS ANTI-CHOLINESTERASE.
METABOLISM	NRC. DRINKING WATER & HEALTH 1977 622 ...ENZYMES /ARE/ RESPONSIBLE FOR ITS DEGRADATION TO NONTOXIC METABOLITES. THESE ARE...PHOSPHATASES & CARBOXYLESTERASES OR ALIESTERASES. ... ...IT HAS BEEN SHOWN THAT DEGRADATION...OF MALAOXON EXCEEDS ACTIVATION RATE OF MALATHION, SO THERE IS LITTLE ACCUMULATION OF TOXIC ACTIVATION PRODUCT IN MAMMALIAN SYSTEMS.
METABOLISM	NRC. DRINKING WATER & HEALTH 1977 622 MALATHION IS PHOSPHORODITHIOATE...REQUIRES ACTIVATION TO PHOSPHATE...TO BECOME ACTIVE CHOLINESTERASE AGENT. ...CONVERSION...TO MALAOXON...CARRIED OUT BY LIVER MICROSOMAL MONOOXYGENASE SYSTEM. ...ENZYMES RESPONSIBLE FOR ITS DEGRADATION TO NONTOXIC METABOLITES. ... PRODUCTS...ARE MALATHION MONOESTERS...PHOSPHORIC ACIDS...
METABOLISM	MENZIE. METAB PESTICIDES 1978 165 ...RESISTANT & NON-RESISTANT HOUSEFLY STRAINS, IN VITRO STUDIES SHOWED...RESISTANT...DEGRADED MALAOXON OXIDATIVELY AT RATE 10 TIMES HIGHER THAN...SUSCEPTIBLE... OXIDATION PRODUCT WAS MALAOXON BETA-MONOCARBOXYLIC ACID.../IN/ SUSCEPTIBLE... RESISTANT...PRODUCED SOME BETA-MONOACID BUT MALAOXON ALPHA-MONOACID...MAIN METABOLITE.
METABOLISM	MENZIE. METAB PESTICIDES 1978 165 ...ARTHROBACTER SP...WAS CAPABLE OF DEGRADING MALATHION. ...IDENTIFIED METABOLITES AS MALATHION HALF ESTER, DICARBOXYLIC ACID, DIMETHYL PHOSPHORODITHIOATE & DIMETHYL PHOSPHOROTHIOATE.
METABOLISM	MENZIE. METAB PESTICIDES 1978 165 HETEROGENEOUS BACTERIAL POPULATION WAS ISOLATED FROM RIVER WATER & INCUBATED WITH MALATHION AS SOLE CARBON SOURCE. ABOUT 1 %...WAS CONVERTED TO DICARBOXYLIC ACID, DIETHYL MALEATE, & O,O-DIMETHYL PHOSPHOROTHIOIC ACID. MAJOR METABOLITE WAS BETA-MONOACID.
METABOLISM	MENZIE. METAB PESTICIDES 1978 165 ...LARVAL HOMOGENATES OF MALATHION-RESISTANT &...SUSCEPTIBLE...INDIAN MEAL MOTH (PLODIA INTERPUNCTELLA HUBNER)...TESTED FOR ESTERASE ACTIVITY, RESISTANT STRAIN HAD GREATER ALPHA-NAPHTHYL ACETATE ESTERASE...LESS CARBOXYLESTERASE & BUTYRYLCHOLINESTERASE; & SIMILAR ACETYLCHOLINESTERASE ACTIVITY...
METABOLISM	MENZIE. METAB PESTICIDES 1974 234 IN SOIL-FREE ACID SYSTEMS (MORE THAN PH 2) HYDROLYSIS DID NOT OCCUR...SLOW AT PH 9 (LESS THAN 50 % IN 20 DAYS)...RAPID AT PH 11 (MORE THAN 99 % IN 1 DAY). AT PH 9 HYDROLYSIS PRODUCED THIOMALIC ACID, DIMETHYL THIOPHOSPHATE, & DIETHYL THIOMALATE. IN SOIL BOTH ESTERS WERE HYDROLYZED...DIETHYL THIOMALATE ACCUMULATED IN SOME...
STATUS	060179COMPLETE WITH PEER REVIEW COMMENTS INCORPORATED
ANIMAL/NON-HUMAN TOX EX	GARNER'S VET TOX 3RD ED 250 DIPPING 4 TIMES AT 4-DAY INTERVALS IN A 2% SOLUTION OF 57%

EXAMPLE 1: TDB (Continued)

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                          'EMULSIFIABLE SOLUTION'...WAS WITHOUT EFFECT
                          UPON DOGS.
ANIMAL TOXICITY KEYWORDS  CHRONIC;DOGS;ND;DERMAL;ND;NO EFFECT
ANIMAL/NON-HUMAN TOX EX   GARNER'S VET TOX 3RD ED 250 ...DOGS...SINGLE
                          DOSES OF 500-3500 MG/KG...ORALLY.
                          ALL...VOMITED WITHIN 35 MIN...NO...SIGNS OF
                          TOXICITY. WHEN VOMITING...PREVENTED BY
                          GENERAL ANESTHESIA, NO...TOXICITY...OBSERVED
                          AFTER RECOVERY...
ANIMAL TOXICITY KEYWORDS  ACUTE;DOGS;ND;ORAL;DIGESTIVE SYSTEM;VOMITING
ANIMAL/NON-HUMAN TOX EX   NRC. DRINKING WATER & HEALTH 1977 623 /IN
                          RATS/ AT 1000 PPM & HIGHER...RED-CELL
                          CHOLINESTERASE ACTIVITY...DECR. IP
                          INJECTION...FOR 60 DAYS RESULTED
                          IN...NO-ADVERSE-EFFECT LEVELS OF 100
                          MG/KG...BUT...DOSAGES OF 200 & 300 MG/KG /PER
                          DAY/ RESULTED IN MORTALITY RATES OF 60 &
                          100%, RESPECTIVELY.
ANIMAL TOXICITY KEYWORDS  ND;RATS;ND;ND;METABOLISM AND NUTRITION
                          CHOLINESTERASE;ENZYME REPRESSION
                          CHRONIC;RATS;ND;INJECTIONS, INTRAPERITONEAL
                          ND;DEATH
CONTINUE PRINTING? (YES/NO)

USER:
yes

PROG:

ANIMAL/NON-HUMAN TOX EX   NRC. DRINKING WATER & HEALTH 1977 625 NO
                          TERATOGENIC EFFECTS...OBSERVED WHEN
                          RATS...TREATED IP WITH MALATHION AT 900
                          MG/KG. ... ON DAY 11 AFTER
                          INSEMINATION...RATS WERE GIVEN SINGLE IP
                          INJECTION...
ANIMAL TOXICITY KEYWORDS  ACUTE;RATS;ND;INJECTIONS, INTRAPERITONEAL
                          PREGNANCY;FETUS;NO EFFECT;TERATOGENESIS
ANIMAL/NON-HUMAN TOX EX   SPENCER, GUIDE TO CHEM IN CROP PROTECT 318 NO
                          EVIDENCE OF PHYTOTOXICITY...
ANIMAL TOXICITY KEYWORDS  ND;PLANTS;ND;ND;ND;TOXICITY, NONE
ANIMAL/NON-HUMAN TOX EX   FOREIGN COMPD METAB IN MAMMALS VOL 3 678
                          CHRONIC TREATMENT OF RATS WITH EXTREMELY HIGH
                          DOSES OF MALATHION AFFECTED GROWTH OF PROGENY
                          IN SECOND GENERATION.
ANIMAL TOXICITY KEYWORDS  CHRONIC;RATS;ND;ND;PREGNANCY;FETUS;GROWTH
                          DISORDERS
ANIMAL/NON-HUMAN TOX EX   FOREIGN COMPD METAB IN MAMMALS VOL 3 678
                          ...ACUTE TOXICITY OF...ORGANOPHOSPHATE
                          INSECTICIDES IN...WEANLING MALE
                          RATS...COMPARED WITH THAT IN ADULTS.
                          WEANLINGS WERE FOUND TO BE APPROX TWICE AS
                          SUSCEPTIBLE TO...MALATHION...
ANIMAL TOXICITY KEYWORDS  ACUTE;RATS;ND;ND;ND;TOXICITY;AGE FACTORS
ANIMAL/NON-HUMAN TOX EX   GRANT. TOX OF THE EYE 1974 640 UNDILUTED
                          TECHNICAL LIQ MALATHION DROPPED ON RABBIT'S
                          EYE CAUSED SLIGHT IMMEDIATE IRRITATION WITH
                          CONJUNCTIVAL HYPEREMIA & EDEMA OF LIDS...
ANIMAL TOXICITY KEYWORDS  ACUTE;RABBITS;ND;OCULAR;EYE;EYE BURNS
                          CONJUNCTIVA;HYPEREMIA;EYELIDS;EDEMA
ANIMAL/NON-HUMAN TOX EX   GARNER'S VET TOX 3RD ED 250 SPRAYS CONTAINING
                          1%...WERE LETHAL TO CALVES. PERSISTENT MUSCLE
                          WEAKNESS...IN CHICKENS FOLLOWING SINGLE DOSES
                          OF 100 MG/KG... ... USED...1.25% AS SPRAY OR
                          4% AS DUSTING POWDER...APPEARS TO BE HARMLESS
                          TO POULTRY.
ANIMAL TOXICITY KEYWORDS  ND:CATTLE;ND;PERCUTANEOUS;ND:DEATH
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EXAMPLE 1: TDB (Continued)

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                        ACUTE;CHICKENS;ND;ND;MUSCULOSKELETAL SYSTEM
                        MUSCLES;FATIGUE
                        ND;CHICKENS;ND;DERMAL;ND;NO EFFECT
ANIMAL/NON-HUMAN TOX EX GARNER'S VET TOX 3RD ED 251 ...100 PPM...IN
                        DIET OF CHICKENS DOES NOT AFFECT THEIR GROWTH
                        OR FEED CONVERSION. UP TO 15 PPM DOES NOT
                        AFFECT HATCHABILITY OF PULLETS' EGGS. BLOOD
                        CHOLINESTERASE...IN CALVES GIVEN 2
                        MG/KG...DAILY FOR UP TO 13 DAYS FELL TO
                        50%...RETURNED TO NORMAL WHEN ADMIN CEASED...
ANIMAL TOXICITY KEYWORDS CHRONIC;CHICKENS;ND;ORAL;ND;NO EFFECT
                        CHRONIC;CATTLE;ND;ND;METABOLISM AND NUTRITION
                        CHOLINESTERASE
ANIMAL/NON-HUMAN TOX EX GARNER'S VET TOX 3RD ED 243 ...MALATHION,
                        LEAST TOXIC OF
                        /ORGANOPHOSPHORUS/...INSECTICIDES...SKIN
                        ABSORPTION IS ONLY SLOW & SLIGHT.
ANIMAL TOXICITY KEYWORDS ND;ND;ND;ND;ND;TOXICITY, LOW
                        ND;ND;ND;PERCUTANEOUS;ND;TOXICITY, LOW
ANIMAL/NON-HUMAN TOX EX GARNER'S VET TOX 3RD ED 255 ...ACUTE
                        POISONING... ...CAUSES SALIVATION, ABDOMINAL
                        PAIN, VOMITING & DIARRHEA...BRONCHIAL
                        SECRETION & SPASM... ...FASCICULATIONS,
                        IRREGULAR VIOLENT CONTRACTIONS...WEAKNESS OF
                        VOLUNTARY MUSCLES... DEATH OCCURS FROM RESP
                        FAILURE. /ORGANOPHOSPHORUS INSECTICIDES/
ANIMAL TOXICITY KEYWORDS ACUTE;ND;ND;ND;ND;POISONING;DEATH;ABDOMEN
                        PAIN
                        ACUTE;ND;ND;ND;MOUTH AND TEETH
                        SIALORRHEA
                        ACUTE;ND;ND;ND;DIGESTIVE SYSTEM;VOMITING
                        DIARRHEA
                        ACUTE;ND;ND;ND;RESPIRATORY SYSTEM;MUCOUS
                        MEMBRANE;MUCUS;BRONCHIAL SPASM;RESPIRATORY
                        INSUFFICIENCY
                        ACUTE;ND;ND;ND;MUSCULOSKELETAL SYSTEM;MUSCLE
                        CRAMP;MUSCLES;FATIGUE
ANIMAL/NON-HUMAN TOX EX GARNER'S VET TOX 3RD ED 255 CHRONIC POISONING
                        LEADS TO EXCESSIVE SECRETIONS & HYPERACTIVITY
                        OF GUT...GENERAL WEAKNESS...PERSISTENT
                        MUSCULAR TWITCHINGS. ANIMALS MAY LOSE WT FROM
                        INABILITY TO FEED & DRINK DUE TO MUSCULAR
                        WEAKNESS. /ORGANOPHOSPHORUS INSECTICIDES/
ANIMAL TOXICITY KEYWORDS CHRONIC;ANIMALS;ND;ND;ND;FATIGUE
                        EMACIATION
                        CHRONIC;ANIMALS;ND;ND;DIGESTIVE SYSTEM
                        DIARRHEA;GASTROINTESTINAL MOTILITY
                        GASTROINTESTINAL DISEASES
                        CHRONIC;ANIMALS;ND;ND;MUSCULOSKELETAL SYSTEM
                        MUSCLE CRAMP;MUSCLES;FATIGUE
ANIMAL/NON-HUMAN TOX EX GARNER'S VET TOX 3RD ED 245
                        ...(...ORGANOPHOSPHORUS COMPD) OR ITS
                        METABOLITES CAN CROSS PLACENTA OF GOAT &
                        DEPRESS CHOLINESTERASE ACTIVITY OF FETUSES
                        BY...85 %... /ORGANOPHOSPHORUS INSECTICIDES/
ANIMAL TOXICITY KEYWORDS ND;GOATS;ND;ND;PREGNANCY;FETAL DISEASES
                        CHOLINESTERASE;ENZYME REPRESSION
ANIMAL/NON-HUMAN TOX EX WHITE-STEVENS. PEST IN ENVIRON VOL 1 488
                        POPULATIONS OF HOUSEFLY...DEVELOPED
                        /AVOIDANCE/...CHARACTERISTIC TO MALATHION IN
                        SUGAR BAITS; THIS...IS INTENSIFIED BY FURTHER
                        MALATHION SELECTION. ...SPOTTED ROOT
                        FLY...DEVELOPED AVOIDANCE OF RESIDUAL
                        DEPOSITS...THEY TAKE OFF SOON AFTER
                        /CONTACT/...BEING MORE LIABLE TO
                        /IRRITATION/...SINCE THEY.../DETOXIFY
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EXAMPLE 1: TDB (Continued)

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                                MALATHION LESS/.
CONTINUE PRINTING? (YES/NO)

USER:
yes

PROG:

ANIMAL TOXICITY KEYWORDS    ND;HOUSEFLIES;ND;ND;ND;INSECTICIDE
                            RESISTANCE
                            ND;FLIES;ND;ND;ND;INSECTICIDE RESISTANCE
ANIMAL/NON-HUMAN TOX EX     WHITE-STEVENS. PEST IN ENVIRON VOL 1 489 THE
                            DEVELOPMENT OF INCREASED IRRITABILITY TO
                            DEPOSITS OF...MALATHION BY LABORATORY
                            SELECTION IN /SPOTTED ROOT FLIES/...WAS FOUND
                            TO BE ASSOCIATED WITH A DECREASE IN /THE
                            FLY'S ABILITY TO DETOXIFY THE COMPD/...
ANIMAL TOXICITY KEYWORDS    ND;FLIES;ND;ND;PSYCHOLOGICAL PROCESSES
                            BEHAVIOR, ANIMAL
HUMAN TOXICITY EXCERPT      GOSSELIN. CTCP 4TH ED II-195 IN EXPTL STUDY,
                            MALATHION WAS FOUND TO BE WEAK CONTACT
                            SENSITIZER, INDUCING MILD CUTANEOUS REACTION
                            IN HIGH PROPORTION OF SUBJECTS.
HUMAN TOXICITY KEYWORDS     ND;ND;ND;ND;PERCUTANEOUS;SKIN;DERMATITIS,
                            CONTACT
                            ND;ND;ND;ND;PERCUTANEOUS;IMMUNE SYSTEM;DRUG
                            HYPERSENSITIVITY
HUMAN TOXICITY EXCERPT      NAC. DRINKING WATER & HEALTH 1977 622 ...UP
                            TO 16 MG OF MALATHION MAY BE INGESTED DAILY
                            FOR...47 DAYS WITH NO...EFFECT ON PLASMA OR
                            RED-CELL CHOLINESTERASE ACTIVITY.
HUMAN TOXICITY KEYWORDS     CHRONIC;ND;ND;ND;ORAL;ND;NO EFFECT
HUMAN TOXICITY EXCERPT      GOODMAN. PHARM BASIS THERAP 5TH ED 453
                            ...APPLIED LOCALLY TO CONJUNCTIVA,
                            ANTICHOLINESTERASE AGENTS CAUSE...HYPEREMIA &
                            CONSTRICTION OF IRIS SPHINCTER (MIOSIS) &
                            CILIARY MUSCLE... INTRAOCULAR PRESSURE
                            USUALLY FALLS... /ORGANOPHOSPHORUS
                            INSECTICIDES/
HUMAN TOXICITY KEYWORDS     ND;ND;ND;ND;OCULAR;EYE;BLEPHAROSPASM;PUPIL
                            CONSTRICTION, PATHOLOGIC;INTRAOCULAR PRESSURE
HUMAN TOXICITY EXCERPT      GOSSELIN. CTCP 4TH ED II-194 SEE PARATHION.
                            SYMPTOMATOLOGY: 1. NAUSEA...VOMITING,
                            ABDOMINAL CRAMPS, DIARRHEA, EXCESSIVE
                            SALIVATION... 2. HEADACHE, GIDDINESS, VERTIGO
                            & WEAKNESS. 3. RHINORRHEA & SENSATION OF
                            TIGHTNESS IN CHEST ARE COMMON IN INHALATION
                            EXPOSURES. /PARATHION/
HUMAN TOXICITY KEYWORDS     ND;ND;ND;ND;ND;DIGESTIVE SYSTEM;VOMITING
                            DIARRHEA;NAUSEA
                            ND;ND;ND;ND;ND;ND;HEADACHE;ASTHENIA;ABDOMEN
                            PAIN
                            ND;ND;ND;ND;ND;MOUTH AND TEETH;SIALORRHEA
                            ND;ND;ND;ND;ND;NERVOUS SYSTEM;VERTIGO
                            ND;ND;ND;ND;ND;PSYCHOLOGICAL PROCESSES
                            EUPHORIA
                            ND;ND;ND;ND;INHALATION;RESPIRATORY SYSTEM
                            RHINITIS;DYSPNEA;NASAL MUCOSA
                            ND;ND;ND;ND;INHALATION;ND;THORAX;PAIN
HUMAN TOXICITY EXCERPT      GOSSELIN. CTCP 4TH ED II-194 SEE PARATHION.
                            SYMPTOMATOLOGY: 4. BLURRING OR DIMNESS OF
                            VISION, MIOSIS...TEARING, CILIARY MUSCLE
                            SPASM, LOSS OF ACCOMMODATION & OCULAR PAIN.
                            ... ...MYDRIASIS...SOMETIMES SEEN...PROBABLY
                            DUE TO SYMPATHO-ADRENAL DISCHARGE.
                            /PARATHION/
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EXAMPLE 1: TDB (Continued)

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HUMAN TOXICITY KEYWORDS    ND;ND;ND;ND;ND;BODY FLUIDS ANE SECRETIONS
                           TEARS
                           ND;ND;ND;ND;ND;EYE;PAIN;PUPIL;DILATATION,
                           PATHOLOGIC;VISION DISORDERS;SPASM
                           CONSTRICTION, PATHOLOGIC
HUMAN TOXICITY EXCERPT     GOSSELIN. CTCP 4TH ED II-194 SEE PARATHION.
                           SYMPTOMATOLOGY: 5. LOSS OF MUSCLE
                           COORDINATION, SLURRING OF SPEECH,
                           FASCICULATIONS & TWITCHING OF MUSCLES
                           (PARTICULARLY OF TONGUE & EYELIDS), &
                           GENERALIZED PROFOUND WEAKNESS. 6. MENTAL
                           CONFUSION, DISORIENTATION & DROWSINESS.
                           /PARATHION/
HUMAN TOXICITY KEYWORDS    ND;ND;ND;ND;ND;MUSCULOSKELETAL SYSTEM
                           MUSCULAR DISEASES;MUSCLE CRAMP
                           ND;ND;ND;ND;ND;NERVOUS SYSTEM;ATAXIA;SPEECH
                           DISORDERS;HYPERSOMNIA
                           ND;ND;ND;ND;ND;PSYCHOLOGICAL PROCESSES
                           PERCEPTUAL DISORDERS;CONFUSION
                           ND;ND;ND;ND;ND;ASTHENIA
                           ND;ND;ND;ND;EYE;BLEPHAROSPASM
                           ND;ND;ND;ND;ND;MOUTH AND TEETH;TONGUE;SPASM
HUMAN TOXICITY EXCERPT     GOSSELIN. CTCP 4TH ED II-194 SEE PARATHION.
                           SYMPTOMATOLOGY: 7. DIFFICULTY IN BREATHING,
                           EXCESSIVE SECRETION OF SALIVA & OF RESP TRACT
                           MUCUS, ORONASAL FROTHING, CYANOSIS, PULMONARY
                           RALES & RHONCHI, & HYPERTENSION, (PRESUMABLY
                           DUE TO ASPHYXIA). 8. RANDOM JERKY MOVEMENTS,
                           INCONTINENCE, CONVULSIONS, & COMA.
                           /PARATHION/
HUMAN TOXICITY KEYWORDS    ND;ND;ND;ND;ND;MOUTH AND TEETH;SIALORRHEA
                           ND;ND;ND;ND;ND;RESPIRATORY SYSTEM;RESPIRATION
                           DISORDERS;NASOPHARYNGEAL DISEASES;ASPHYXIA
                           DYSPNEA;NASAL MUCOSA;MUCUS
                           ND;ND;ND;ND;ND;SKIN;CYANOSIS
                           ND;ND;ND;ND;ND;CARDIOVASCULAR SYSTEM
                           HYPERTENSION
                           ND;ND;ND;ND;ND;MUSCULOSKELETAL SYSTEM;MUSCLE
                           CRAMP
                           ND;ND;ND;ND;ND;DIGESTIVE SYSTEM;FECAL
                           INCONTINENCE
                           ND;ND;ND;ND;ND;UROGENITAL SYSTEM;URINARY
                           INCONTINENCE
                           ND;ND;ND;ND;ND;NERVOUS SYSTEM;CONVULSIONS
                           COMA;HYPERKINESIS;SPASM
CONTINUE PRINTING? (YES/NO)

USER:
yes

PROG:

HUMAN TOXICITY EXCERPT     GOSSELIN. CTCP 4TH ED II-194 SEE PARATHION.
                           SYMPTOMATOLOGY: 9. DEATH PRIMARILY DUE TO
                           RESP ARREST ARISING FROM FAILURE OF RESP
                           CENTER, PARALYSIS OF RESP MUSCLES,
                           INTENSE-BRONCHOCONSTRICTION, OR ALL THREE.
                           /PARATHION/
HUMAN TOXICITY KEYWORDS    ND;ND;ND;ND;ND;RESPIRATORY SYSTEM;RESPIRATORY
                           PARALYSIS;BRONCHIAL SPASM;CONSTRICTION,
                           PATHOLOGIC
                           ND;ND;ND;ND;ND;NERVOUS SYSTEM;RESPIRATORY
                           CENTER;CENTRAL NERVOUS SYSTEM DISEASES
                           PARALYSIS
INTERACTION EXCERPT        NRC. DRINKING WATER & HEALTH 1977 622
                           TOXICITY...POTENTIATED BY O-ETHYL
```

EXAMPLE 1: TDB (Continued)

```
                        O-PARA-NITROPHENYL
                        PHENYLPHOSPHOROTHIOATE...&...OTHER
                        ORGANOPHOSPHORUS COMPD. ...POTENTIATION
                        RESULTS FROM INHIBITION OF CARBOXYLESTERASE
                        OR ALIESTERASE...RESPONSIBLE FOR
                        DEGRADATION... ...THIS MECHANISM...LEAD TO
                        INCR FORMATION OF MALAOXON, ACTIVATION
                        PRODUCT...
INTERACTANTS CAS NOS    000121755;MALATHION
                        ND;ORGANOPHOSPHORUS COMPOUNDS
INTERACTION EXCERPT     GOODMAN. PHARM BASIS THERAP 5TH ED 455
                        ...EFFECTS OF EXPOSURE TO 2 ORGANOPHOSPHORUS
                        INSECTICIDES MAY BE SUPRA-ADDITIVE. ...WHEN
                        MALATHION IS ADMIN TO ANIMALS...WITH EPN,
                        RESULTING TOXICITY IS...50 TIMES WHAT WOULD
                        BE EXPECTED FROM SUM OF THEIR INDIVIDUAL
                        TOXICITIES. ...APPARENTLY DUE...TO INHIBITION
                        BY EPN OF ENZYME SYSTEMS THAT NORMALLY
                        METABOLIZE MALATHION...
INTERACTANTS CAS NOS    000121755;MALATHION
                        ND;EPN
INTERACTION EXCERPT     GOSSELIN. CTCP 4TH ED II-194 SPECIFIC
                        INHIBITION OF ALI-ESTERASES SUCH AS BY
                        TRI-O-TOLYL PHOSPHATE CAN LEAD TO 100-FOLD
                        INCR IN ACUTE TOXICITY OF MALATHION.
INTERACTANTS CAS NOS    000121755;MALATHION
                        ND;TRITOLYL PHOSPHATE
LAB METHODS EXCERPT     SUNSHINE. HDBK ANALY TOX 1969 521 THIN LAYER
                        CHROMATOGRAPHY; WALKER, KC & M BEROZA, J
                        ASSOC OFFIC AGR CHEM 46, 250 (1963).
LAB METHODS KEYWORDS    ND;CHROMATOGRAPHY, THIN LAYER
LAB METHODS EXCERPT     SUNSHINE. HDBK ANALY TOX 1969 521 GAS-LIQUID
                        CHROMATOGRAPHY; BURKE, JERRY A & WENDELL
                        HOLSWADE, J ASSOC OFFIC AGR CHEM 49, 377
                        (1966).
LAB METHODS KEYWORDS    ND;CHROMATOGRAPHY, GAS-LIQUID
LAB METHODS EXCERPT     SUNSHINE. HDBK ANALY TOX 1969 521 GENERAL
                        SAMPLE, SPECTROPHOTOMETRY; ZWEIG, GUNTER,
                        ANAL METHODS FOR PESTICIDES, PLANT GROWT
                        REGULATORS & FOOD ADDITIVES, ACADEMIC PRESS
                        NY, NY...19..?...
LAB METHODS KEYWORDS    GENERAL SAMPLE;SPECTROPHOTOMETRY
LAB METHODS EXCERPT     SPENCER. GUIDE TO CHEM IN CROP PROTECT 319
                        RESIDUES...IN FRUIT & VEGETABLES...J ASSOC
                        OFF AGRIC CHEM, 40, 230, 1957.
LAB METHODS KEYWORDS    RESIDUES;ND
LAB METHODS EXCERPT     MARTIN. PESTICIDE MANUAL 4TH ED 321 GLC
                        METHODS ARE AVAILABLE FOR WIDE RANGE OF
                        CROPS; PARTICULARS MAY BE OBTAINED FROM
                        AMERICAN CYANAMID COMPANY.
LAB METHODS KEYWORDS    RESIDUES;CHROMATOGRAPHY, GAS-LIQUID
LAB METHODS EXCERPT     AOAC. 10TH ED 1965 AND FOLLOWING ED 12/518
                        29.001-29.024. MULTIPLE RESIDUES...PHOSPHATED
                        PESTICIDES /IN FOODS DETERMINED BY
                        CHROMATOGRAPHY/.
LAB METHODS KEYWORDS    FOOD;CHROMATOGRAPHY

SS 5 /C?
USER:
```

EXAMPLE 2: RTECS UNIT RECORD

```
file rtecs

PROG:
YOU ARE NOW CONNECTED TO THE RTECS FILE.
TOXICITY DATA IN NIOSH'S RTECS HAVE NOT BEEN CRITICALLY EVALUATED.

SS 1 /C?
USER:
malathion (sy)

PROG:
SS (1) PSTG (1)

SS 2 /C?
USER:
print detailed, complete, indented

PROG:

SECONDARY SOURCE ID          NIOSH/WM8400000
CAS TYPE 1 NAME              SUCCINIC ACID, MERCAPTO-, DIETHYL ESTER,
                             S-ester with O,O-DIMETHYL PHOSPHORODITHIOATE

CAS REGISTRY NUMBER          121-75-5
CLASSIFICATION CODE          AGRICULTURAL CHEMICAL
CLASSIFICATION CODE          TUMORIGEN
CLASSIFICATION CODE          MUTAGEN
AQUATIC TOXICITY RATING      AQUATIC TOXICITY RATING: TLm96:10-under 1 ppm
                             WQCHM* "Water Quality Characteristics of
                             Hazardous Materials," W. Hann, and P.A.
                             Jensen, Environmental Engineering Division,
                             Civil Engineering Department, Texas A & M
                             University, Volumes 1-4, 1974 3,-,74
TOXICOLOGY/CANCER REVIEW     THRESHOLD LIMIT VALUE-air:10 mg/m3 (skin)
                             DTLVS* "Documentation of Threshold Limit
                             Values for Substances in Workroom Air,"
                             Cincinnati, Ohio, American Conference of
                             Governmental Industrial Hygienists, 1971
                             4,249,80
TOXICOLOGY/CANCER REVIEW     TOXICOLOGY REVIEW AQMOAC Air Quality
                             Monographs. #73-19,1973//RREVAH Residue
                             Reviews. 46,1,73//CNDQA8 Cahiers de Nutrition
                             et de Dietetique. 10(3),43,75//PMDCAY
                             Progress in Medical Chemistry.
                             10,85,74//DTTIAF Deutsche Tieraerztliche
                             Wochenschrift. 80(20),485,73//RREVAH Residue
                             Reviews. 63,1,76//27ZT Gleason, et al., 3rd
                             Ed., Baltimore, Williams, and Wilkins, 1969.
                             3,89,69
STANDARDS/REGULATIONS        OSHA STANDARD-air:TWA 15 mg/m3 (skin) (SCP-U)
                             FEREAC Federal Register. 39,23540,74
STANDARDS/REGULATIONS        DOT-ORM-A, LABEL:NONE FEREAC Federal
                             Register. 41,57018,76
NIOSH CRITERIA DOCUMENT      CRIT DOC. OCCUPATIONAL EXPOSURE TO MALATHION
                             recm std-air:TWA 15 mg/m3 NTIS** National
                             Technical Information Service.
STATUS                       NCI CARCINOGENESIS BIOASSAY COMPLETED;RESULTS
                             NEGATIVE (NCITR* NCI-CG-TR-24,78)
STATUS                       NCI CARCINOGENESIS BIOASSAY COMPLETED;RESULTS
                             NEGATIVE (NCITR* NCI-CG-TR-192,79)
```

EXAMPLE 2: RTECS (Continued)

```
                              NEGATIVE (NCI)[8]-NCI-CG-R-192, 77
STATUS                        "NIOSH MANUAL OF ANALYTICAL METHODS" VOL 3
                              S370
                              NIMAM*
SYNONYMS                      AMERICAN CYANAMID 4,049
SYNONYMS                      S-(1,2-BIS(AETHOXY-CARBONYL)-AETHYL)-O,O-DIME-
                              THYL-DITHIOPHASPHAT (German)
SYNONYMS                      S-(1,2-BIS(ETHOXY-CARBONYL)-ETHYL)-O,O-DIMETH-
                              YL-DITHIOFOSFAAT (Dutch)
SYNONYMS                      S-(1,2-BIS(ETHOXYCARBONYL)ETHYL) O,O-DIMETHYL
                              PHOSPHORODITHIOATE
SYNONYMS                      S-1,2-BIS(ETHOXYCARBONYL)ETHYL-O,O-DIMETHYL
                              THIOPHOSPHATE
SYNONYMS                      S-(1,2-BIS(ETOSSI-CARBONIL)-ETIL)-O,O-DIMETIL-
                              -DITIOFOSFATO (Italian)
SYNONYMS                      CALMATHION
SYNONYMS                      CARBETOX
SYNONYMS                      CARBETHOXY MALATHION
SYNONYMS                      CARBOFOS
SYNONYMS                      CARBOPHOS
SYNONYMS                      CHEMATHION
SYNONYMS                      COMPOUND 4049
SYNONYMS                      CYTHION
SYNONYMS                      DETMOL MA 96%
SYNONYMS                      DICARBOETHOXYETHYL O,O-DIMETHYL
                              PHOSPHORODITHIOATE
SYNONYMS                      1,2-DI(ETHOXYCARBONYL)ETHYL O,O-DIMETHYL
                              PHOSPHORODITHIOATE
SYNONYMS                      S-(1,2-DI(ETHOXYCARBONYL)ETHYL DIMETHYL
                              PHOSPHOROTHIOLOTHIONATE
SYNONYMS                      DIETHYL MERCAPTOSUCCINATE, O,O-DIMETHYL
                              DITHIOPHOSPHATE, S-ESTER
SYNONYMS                      DIETHYL MERCAPTOSUCCINATE, O,O-DIMETHYL
                              PHOSPHORODITHIOATE
SYNONYMS                      DIETHYL MERCAPTOSUCCINATE, O,O-DIMETHYL
                              THIOPHOSPHATE
SYNONYMS                      O,O-DIMETHYL
                              S-(1,2-BIS(ETHOXYCARBONYL)ETHYL)DITHIOPHOSPHA-
                              TE
SYNONYMS                      O,O-DIMETHYL-S-(1,2-DICARBETHOXYETHYL)
                              DITHIOPHOSPHATE
SYNONYMS                      O,O-DIMETHYL
                              S-(1,2-DICARBETHOXYETHYL)PHOSPHORODITHIOATE
SYNONYMS                      O,O-DIMETHYL S-(1,2-DICARBETHOXYETHYL)
                              THIOTHIONOPHOSPHATE
SYNONYMS                      O,O-DIMETHYL S-1,2-DI(ETHOXYCARBAMYL)ETHYL
                              PHOSPHORODITHIOATE
SYNONYMS                      O,O-DIMETHYL-S-1,2-DIKARBETOXYLETHYLDITIOFOSF-
                              AT (Czech)
SYNONYMS                      O,O-DIMETHYLDITHIOPHOSPHATE
                              DIETHYLMERCAPTOSUCCINATE
SYNONYMS                      DITHIOPHOSPHATE DE O,O-DIMETHYLE ET DE
                              S-(1,2-DICARBOETHOXYETHYLE) (French)
SYNONYMS                      EMMATOS
SYNONYMS                      EMMATOS EXTRA
SYNONYMS                      ENT 17,034
SYNONYMS                      ETHIOLACAR
SYNONYMS                      EXPERIMENTAL INSECTICIDE 4049
SYNONYMS                      FORMAL
SYNONYMS                      FOSFOTHION
SYNONYMS                      FOSFOTION
SYNONYMS                      FOUR THOUSAND FORTY-NINE
CONTINUE PRINTING? (YES/NO)

USER:
yes
```

EXAMPLE 2: RTECS (Continued)

PROG:

SYNONYMS	FYFANON
SYNONYMS	INSECTICIDE NO. 4049
SYNONYMS	KARBOFOS
SYNONYMS	KOP-THION
SYNONYMS	KYPFOS
SYNONYMS	MALACIDE
SYNONYMS	MALAKILL
SYNONYMS	MALAGRAN
SYNONYMS	MALAMAR
SYNONYMS	MALAMAR 50
SYNONYMS	MALAPHELE
SYNONYMS	MALAPHOS
SYNONYMS	MALASPRAY
SYNONYMS	MALATHION
SYNONYMS	MALATHION (DOT)
SYNONYMS	MALATHION LV CONCENTRATE
SYNONYMS	MALATHON
SYNONYMS	MALATION (Polish)
SYNONYMS	MALATOL
SYNONYMS	MALATOX
SYNONYMS	MALDISON (Australia)
SYNONYMS	MALMED
SYNONYMS	MALPHOS
SYNONYMS	MALTOX
SYNONYMS	MERCAPTOTHION
SYNONYMS	MERCAPTOTION (Argentina)
SYNONYMS	MLT
SYNONYMS	NCI-C00215
SYNONYMS	OLEOPHOSPHOTHION
SYNONYMS	PHOSPHORODITHIOIC ACID, O,O-DIMETHYL ESTER, S-ESTER with DIETHYL MERCAPTOSUCCINATE
SYNONYMS	PHOSPHOTHION
SYNONYMS	SADOFOS
SYNONYMS	SADOPHOS
SYNONYMS	SF 60
SYNONYMS	SIPTOX I
SYNONYMS	SUMITOX
SYNONYMS	VEGFRU MALATOX
SYNONYMS	ZITHIOL
MOLECULAR FORMULA	C10-H19-O6-P-S2
MOLECULAR WEIGHT	330.38
WISWESSER LINE NOTATION	2OV1YVO2&SPS&O1&O1
ENTRY MONTH	8107
TOXIC DATA SOURCE	MUREAV Mutation Research. 52,161,78
TOXDATA KEYWORDS	MUTATION;DNA DAMAGE;E. COLI;BACTERIA;100 mg/L
TOXIC DATA SOURCE	MUREAV Mutation Research. 67,67,72
TOXDATA KEYWORDS	MUTATION;SISTER CHROMATID EXCHANGE;HUMAN HUMANS;FIBROBLAST;SOMATIC CELLS;5 mg/L
TOXIC DATA SOURCE	FOMOAJ Folia Morphologica 35,361,76
TOXDATA KEYWORDS	MUTATION;SPERM MORPHOLOGY;MOUSE;RODENTS;ORAL 18 gm/kg/5OD-I
TOXIC DATA SOURCE	NCITR* National Cancer Institute Carcinogenesis Technical Report Series. NCI-CG-TR-192,79
TOXDATA KEYWORDS	ORAL;RAT;RODENTS;TDLo;61 gm/kg/73W-C ;TOXIC EFFECTS;EQUIVOCAL TUMORIGENIC AGENT
TOXIC DATA SOURCE	AEHLAU Archives of Environmental Health. 21,533,70
TOXDATA KEYWORDS	ORAL;MAN;HUMANS;LDLo;857 mg/kg
TOXIC DATA SOURCE	AEHLAU Archives of Environmental Health. 33,240,78
TOXDATA KEYWORDS	ORAL;WOMAN;HUMANS;LDLo;246 mg/kg
TOXIC DATA SOURCE	SPEADM Special Publication of the

EXAMPLE 2: RTECS (Continued)

```
                                Entomological Society of America. 14-1,-,74
TOXDATA KEYWORDS                ORAL;RAT;RODENTS;LD50;885 mg/kg
TOXIC DATA SOURCE               CMEP** "Clinical Memoranda on Economic
                                Poisons," U. S. Dept. HEW, Public Health
                                Service, Communicable Disease Center,
                                Atlanta, GA, 1956 -,1,56
TOXDATA KEYWORDS                SKIN;RAT;RODENTS;LD50;4444 mg/kg
TOXIC DATA SOURCE               PSEBAA Proceedings of the Society for
                                Experimental Biology and Medicine. 114,509,63
TOXDATA KEYWORDS                INTRAPERITONEAL;RAT;RODENTS;LD50;340 mg/kg
TOXIC DATA SOURCE               JEENAI Journal of Economic Entomology.
                                50(3),356,57
TOXDATA KEYWORDS                SUBCUTANEOUS;RAT;RODENTS;LD50;1000 mg/kg
TOXIC DATA SOURCE               ARZNAD Arzneimittel-Forschung. 5,626,55
TOXDATA KEYWORDS                INTRAVENOUS;RAT;RODENTS;LD50;50 mg/kg
                                ORAL;MOUSE;RODENTS;LD50;775 mg/kg
TOXIC DATA SOURCE               PSEBAA Proceedings of the Society for
                                Experimental Biology and Medicine. 129,699,68
TOXDATA KEYWORDS                INTRAPERITONEAL;MOUSE;RODENTS;LD50;193 mg/kg
TOXIC DATA SOURCE               OIZAAV Osaka Igaku Zasshi. 11,6099,59
TOXDATA KEYWORDS                SUBCUTANEOUS;MOUSE;RODENTS;LD50;221 mg/kg
TOXIC DATA SOURCE               CHABA8 Chemical Abstracts. 52,16618,58
TOXDATA KEYWORDS                INTRAVENOUS;MOUSE;RODENTS;LD50;184 mg/kg
TOXIC DATA SOURCE               TXAPA9 Toxicology and Applied Pharmacology.
                                15,244,69
TOXDATA KEYWORDS                INTRAPERITONEAL;DOG;DOGS;LD50;1857 mg/kg
TOXIC DATA SOURCE               AEHA** U. S. Army, Environmental Hygiene
                                Agency Reports. 99-002-74/76
TOXDATA KEYWORDS                ORAL;RABBIT;RODENTS;LDLo;1200 mg/kg
TOXIC DATA SOURCE               JHEMA2 Journal of Hygiene, Epidemiology,
                                Microbiology and Immunology. 22,115,78
TOXDATA KEYWORDS                ORAL;RABBIT;RODENTS;LD50;250 mg/kg
TOXIC DATA SOURCE               28ZEAL "Pesticide Index," E.H. Frear, ed.,
                                State College, PA, College Science
                                Publications, 1969 5,142,76
TOXDATA KEYWORDS                SKIN;RABBIT;RODENTS;LD50;4100 mg/kg
TOXIC DATA SOURCE               ARZNAD Arzneimittel-Forschung. 5,626,55
TOXDATA KEYWORDS                ORAL;GUINEAPIG;RODENTS;LD50;570
                                mg/kg
                                INTRAPERITONEAL;GUINEAPIG;RODENTS;LD50;550
                                mg/kg
CONTINUE PRINTING? (YES/NO)

USER:
yes

PROG:

TOXIC DATA SOURCE               85DPAN "Wirksubstanzen der Pflanzenschutz und
                                Schadlingsbekampfungsmittel," Werner Perkow,
                                Berlin, Verlag Paul Parey, 1971-1976
                                -,-,71/76
TOXDATA KEYWORDS                ORAL;DOMESTIC;FARM ANIMALS;LD50;500 mg/kg
TOXIC DATA SOURCE               IJLAA4 Indian Journal Animal Science.
                                49,314,79
TOXDATA KEYWORDS                UNKNOWN;CATTLE;FARM ANIMALS;LD50;53 mg/kg
TOXIC DATA SOURCE               GISAAA Gigiena i Sanitariya. 41(8),82,76
TOXDATA KEYWORDS                ORAL;MAMMAL, NOS;;LD50;1500 mg/kg
TOXIC DATA SOURCE               30ZDA9 "Chemistry of Pesticides." N.N.
                                Melnikov, New York, Springer-Verlag, 1971
                                -,357,71
TOXDATA KEYWORDS                UNKNOWN;MAMMAL, NOS;;LD50;500 mg/kg

SS 2 /C?
USER:
```

EXAMPLE 3: RTECS

```
file rtecs

PROG:
YOU ARE NOW CONNECTED TO THE RTECS FILE.
TOXICITY DATA IN NIOSH'S RTECS HAVE NOT BEEN CRITICALLY EVALUATED.

SS 1 /C?
USER:
(cc) agricultural chemical

PROG:
SS (1) PSTG (2590)

SS 2 /C?
USER:
(cc) organometallic

PROG:
SS (2) PSTG (368)

SS 3 /C?
USER:
1 and 2

PROG:
SS (3) PSTG (57)

SS 4 /C?
USER:
(tw) crit and doc

PROG:
SS (4) PSTG (955)

SS 5 /C?
USER:
3 and 4

PROG:
SS (5) PSTG (31)

SS 6 /C?
USER:
print n1 5

PROG:

N1  - AMMONIUM, TRIS(2-HYDROXYETHYL)(PHENYLMERCURIO)-, LACTATE

N1  - ANILINE, 2-(ACETOXYMERCURI)-4-NITRO-

N1  - DISTANNOXANE, HEXABUTYL-

N1  - DISTANNOXANE, HEXAKIS(beta,beta-DIMETHYLPHENETHYL)-

N1  - LEAD, TRIETHYL-, OLEATE

SS 6 /C?
```

EXAMPLE 4: RTECS

```
file rtecs

PROG:
YOU ARE NOW CONNECTED TO THE RTECS FILE.
TOXICITY DATA IN NIOSH'S RTECS HAVE NOT BEEN CRITICALLY EVALUATED.

SS 1 /C?
USER:
(cc) natural product

PROG:
SS (1) PSTG (1751)

SS 2 /C?
USER:
(ix) teratogenic

PROG:
SS (2) PSTG (177)

SS 3 /C?
USER:
1 and 2

PROG:
SS (3) PSTG (18)

SS 4 /C?
USER:
print n1 5

PROG:

N1  - ADRIAMYCIN

N1  - ALANINE,
      N-((5-CHLORO-8-HYDROXY-3-METHYL-1-OXO-7-ISOCHROMANYL)CARBONYL)-3--
      PHENYL-, (-)-

N1  - ANAGYRINE

N1  - CHROMOMYCIN A3

N1  - CONIUM MACULATUM

SS 4 /C?
USER:
```

EXAMPLE 5: RTECS

```
file rtecs

PROG:
YOU ARE NOW CONNECTED TO THE RTECS FILE.
TOXICITY DATA IN NIOSH'S RTECS HAVE NOT BEEN CRITICALLY EVALUATED.

SS 1 /C?
USER:
(ff) s

PROG:
SS (1) PSTG (8807)

SS 2 /C?
USER:
(tw) aquatic and toxicity and rating

PROG:
SS (2) PSTG (442)

SS 3 /C?
USER:
1 and 2

PROG:
SS (3) PSTG (31)

SS 4 /C?
USER:
DOT and 3

PROG:
MH (DOT) (2)
          1  DOT (TW)
          2  DOT (NF)
SPECIFY NUMBERS, ALL, OR, NONE-

USER:
1

PROG:
SS (4) PSTG (18)

SS 5 /C?
USER:
print n1 5

PROG:

N1  - CARBON DISULFIDE

N1  - CHLOROSULFURIC ACID

N1  - FLUOROSULFURIC ACID

N1  - MERCURY(I) SULFATE

N1  - 1-PENTANETHIOL
```

EXAMPLE 6: TDB

```
file tdb

PROG:
YOU ARE NOW CONNECTED TO THE TOXICOLOGY DATA BANK FILE.

SS 1 /C?
USER:
(manf) all lab:

PROG:
SS (1) PSTG (239)

SS 2 /C?
USER:
(phtx) all carcino:

PROG:
SS (2) PSTG (211)

SS 3 /C?
USER:
1 and 2

PROG:
SS (3) PSTG (34)

SS 4 /C?
USER:
print 1 nm, phts, mans, indented

PROG:

NAME OF SUBSTANCE          NICKEL CARBONATE
POISONING POTENTIAL        SAX. DANGER PROPS INDUS MATER 4TH ED     955
                           TOXICITY: A RECOGNIZED CARCINOGEN (SECTION
                           8).
POISONING POTENTIAL        SAX. DANGER PROPS INDUS MATER 4TH ED     955
                           SEE NICKEL COMPD. TOXIC HAZARD RATING: ACUTE
                           LOCAL: IRRITANT 1; ALLERGEN 1. ACUTE
                           SYSTEMIC: INGESTION 1. CHRONIC LOCAL: ALERGEN
                           1. 1= SLIGHT: CAUSES READILY REVERSIBLE
                           CHANGES WHICH DISAPPEAR AFTER END OF
                           EXPOSURE. /NICKEL COMPD/
POISONING POTENTIAL        SAX. DANGER PROPS INDUS MATER 4TH ED     955
                           SEE NICKEL COMPD. TOXIC HAZARD RATING: ACUTE
                           SYSTEMIC: INHALATION 3. CHRONIC LOCAL:
                           IRRITANT 3. CHRONIC SYSTEMIC: INHALATION 3;
                           INGESTION 3. 3= HIGH: MAY CAUSE DEATH OR
                           PERMANENT INJURY AFTER VERY SHORT EXPOSURE TO
                           SMALL QUNATITIES. /NICKEL COMPD/
POISONING POTENTIAL        SAX. DANGER PROPS INDUS MATER 4TH ED     955
                           SEE NICKEL COMPD. NICKEL & MOST SALTS OF
                           NICKEL ARE GENERALLY CONSIDERED NOT TO CAUSE
                           SYSTEMIC POISONING. /NICKEL COMPD/
POISONING POTENTIAL        PRC SUSPECTED CARCINOGEN.
STATUS                     050178COMPLETE WITH PEER REVIEW COMMENTS
                           INCORPORATED.
CLASS. BY MAJOR USE        SRI            CHEMICAL INTERMEDIATE
MAJOR USE                  PRC LABORATORY REAGENT
```

EXAMPLE 6: TDB (Continued)

MAJOR USE	SRI	CHEM INT FOR NICKEL OXIDE
MAJOR USE	SRI	CHEM INT FOR NICKEL POWDER
MAJOR USE	SRI	CHEM INT FOR NICKEL CATALYSTS
MAJOR USE	SRI	COMPONENT OF ELECTRICAL COMPONENTS
CONSUMPTION PATTERN		9.08X10+8 GRAMS ARE USED IN NICKEL CATALYST PRODUCTION FOR ORGANIC CHEM MANUFACTURE, PETROLEUM REFINING AND EDIBLE OIL HARDENING EACH YEAR (1972)
U.S. PRODUCTION	SRI	(1970) >9.08X10+8 GRAMS
U.S. PRODUCTION	SRI	(1975) ND
U.S. IMPORTS	SRI	(1972) ND
U.S. IMPORTS	SRI	(1975) ND
U.S. EXPORTS	SRI	(1972) ND
U.S. EXPORTS	SRI	(1975) ND
U.S. METHOD OF MANUFACT	SRI	ADDITION OF SODA ASH TO A SOLUTION OF NICKEL SULFATE
MANUFACTURERS	SRI	AMERICAN CAN CO, M&T CHEMS INC, SUBSID, EAST CHICAGO, IND
MANUFACTURERS	SRI	CHEMETRON CORP, CHEMS GPOUP, INORGANIC CHEMS DIV, CLEVELAND, OHIO
MANUFACTURERS	SRI	C P CHEMS, INC, SEWAREN, NJ
MANUFACTURERS	SRI	KEWANEE OIL CO, HARSHAW CHEM CO, DIV, INDUST CHEMS DEPT, CLEVELAND, OHIO
MANUFACTURERS	SRI	PVO INTERNATIONAL, INC, BOONTON, NJ
MANUFACTURERS	SRI	RICHARDSON-MERRELL, INC, J T BAKER CHEM CO, SUBSID, PHILLIPSBURG, NJ
MANUFACTURERS	SRI	THE SHEPHERD CHEM CO, CINCINNATI, OHIO
MANUFACTURERS	SRI	TENNECO INC, TENNECO CHEMS, INC, ORGANICS ANDPOLYMERS DIV, ELIZABETH, NJ, LONG BEACH, CALIF

SS 4 /C?
USER:

EXAMPLE 7: TDB

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file tdb

PROG:
YOU ARE NOW CONNECTED TO THE TOXICOLOGY DATA BANK FILE.

SS 1 /C?
USER:
(envr) all rail:

PROG:
SS (1) PSTG (109)

SS 2 /C?
USER:
(phtx) fatal or lethal

PROG:
SS (2) PSTG (742)

SS 3 /C?
USER:
1 and 2

PROG:
SS (3) PSTG (39)

SS 4 /C?
USER:
print 1 nm, mans, envs, ppot, indented

PROG:
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NAME OF SUBSTANCE	TRIETHYL PHOSPHATE
CLASS. BY MAJOR USE	SRI PLASTICIZER
MAJOR USE	MERCK INDEX 9TH ED 1242 AS ETHYLATING AGENT; FORMATION OF POLYESTERS WHICH ARE USED AS INSECTICIDES
MAJOR USE	HAWLEY. CONDENSED CHEM DICTNRY 9TH ED 883 SOLVENT; PLASTICIZER FOR RESINS, PLASTICS, GUMS; CATALYST; LACQUER REMOVER
MAJOR USE	SRI PLASTICIZER FOR CELLULOSE ACETATE
MAJOR USE	SRI FLAME RETARDANT ADDITIVE IN UNSATURATED POLYESTER RESINS
MAJOR USE	SRI INT FOR TETRAETHYL PYROPHOSPHATE INSECTICIDE
CONSUMPTION PATTERN	SRI ND
U.S. PRODUCTION	SRI (1972) 3.63X10+9 GRAMS
U.S. PRODUCTION	SRI (1974) 3.18X10+9 GRAMS (EST)
U.S. IMPORTS	SRI (1972) NEGLIGIBLE
U.S. IMPORTS	SRI (1975) ND
U.S. EXPORTS	SRI (1972) ND
U.S. EXPORTS	SRI (1975) ND
U.S. METHOD OF MANUFACT	SRI REACTION OF TRIETHYL PHOSPHITE & DIETHYL HYDROGEN PHOSPHATE
MANUFACTURING INFO	MERCK INDEX 9TH ED 1242 PREPN: PREPD FROM TETRAETHYL HYPOPHOSPHATE WITH ETHANOL IN PRESENCE OF ALUMINUM ETHOXIDE: MUKAIYAMA ET AL, J ORG CHEM 27, 1815 (1962). MFR BY TREATING TRIETHYL PHOSPHITE WITH DIETHYL HYDROGEN PHOSPHATE: MCCALL, COOVER, US PATENT

EXAMPLE 7: TDB (Continued)

	2,960,529 (1960 TO KODAK).
MANUFACTURING INFO	NFPA. FIRE PROTECT GUIDE ON HAZARD MATLS 132 325M. SUGGESTED HAZARD IDENTIFICATION--REACTIVITY 1. 1= MATERIALS WHICH "IN THEMSELVES: ARE NORMALLY STABLE BUT WHICH MAY BECOME UNSTABLE @ ELEVATED TEMP & PRESSURE OR WHICH MAY REACT WITH WATER WITH SOME RELEASE OF ENERGY BUT NOT VIOLENTLY. CAUTION MUST BE USED IN APPROACHING FIRE & APPLYING WATER.
MANUFACTURING INFO	HAWLEY. CONDENSED CHEM DICTNRY 9TH ED 883 COMPATIBLE WITH MANY GUMS & RESINS. ... WHEN MIXED WITH WATER IS QUITE STABLE @ ROOM TEMP, BUT @ ELEVATED TEMP IT HYDROLYZES SLOWLY.
MANUFACTURERS	SRI EASTMAN KODAK CO, EASTMAN CHEM PRODUCTS, INC, SUBSID, TENNESSEE EASTMAN CO, DIV, KINGSPORT, TENN
STATUS	120179COMPLETE WITH PEER REVIEW COMMENTS INCORPORATED
ENV/OCC EXP & LIMITS	PATTY. INDUS HYG & TOX 2ND ED VOL2 1925 AVOIDANCE OF SKIN CONTACT & INHALATION OF MIST, DUST, OR VAPOR (ESP IF HEATED... ALL PERSONS HANDLING...SHOULD HAVE REGULAR...MEDICAL EXAM /PARTICULARLY/...OCCURRENCE OF ANY EFFECTS ON CNS. ... IF CONTAMINATION OF SKIN OR CLOTHING OCCURS...THOROUGH WASHING WITH SOAP & WATER. /PHOSPHATE ESTERS/
FIRE POTENTIAL	SAX. DANGER PROPS INDUS MATER 4TH ED 1196 FIRE HAZARD: SLIGHT, WHEN EXPOSED TO HEAT OR FLAME. ... TO FIGHT FIRE: WATER, FOAM, CARBON DIOXIDE, CRY CHEMICAL...
FIRE POTENTIAL	HAWLEY. CONDENSED CHEM DICTNRY 9TH ED 883 COMBUSTIBLE
FIRE POTENTIAL	NFPA. FIRE PROTECT GUIDE ON HAZARD MATLS 132 325M. SUGGESTED HAZARD IDENTIFICATION--FLAMMABILITY 1. 1= MATERIALS "THAT MUST BE PREHEATED BEFORE IGNITION CAN OCCUR. WATER MAY CAUSE FROTHING IF IT GETS BELOW SURFACE OF LIQUID & TURNS TO STEAM. ...WATER FOG GENTLY APPLIED TO SURFACE WILL CAUSE FROTHING WHICH WILL EXTINGUISH FIRE.
FIRE POTENTIAL	NFPA. FIRE PROTECT GUIDE ON HAZARD MATLS 132 325M. SUGGESTED HAZARD IDENTIFICATION--HEALTH 0. 0= MATERIALS WHICH ON EXPOSURE UNDER FIRE CONDITIONS WOULD OFFER NO HAZARD BEYOND THAT OF ORDINARY COMBUSTIBLE MATERIAL.
EXPLOSIVE LIMITS	SAX. DANGER PROPS INDUS MATER 4TH ED 1196 DISASTER HAZARD: DANGEROUS...CAN REACT VIGOROUSLY WITH OXIDIZING MATERIALS.
SHIPMENT METHODS	SAX. DANGER PROPS INDUS MATER 4TH ED 1196 IN GENERAL, MATERIALS WHICH ARE TOXIC AS STORED OR WHICH CAN DECOMP INTO TOXIC COMPONENTS...SHOULD BE STORED IN A COOL, WELL-VENTILATED PLACE, OUT OF DIRECT RAYS OF THE SUN, AWAY FROM AREAS OF HIGH FIRE HAZARD, & SHOULD BE PERIODICALLY INSPECTED... INCOMPATIBLE MATERIALS SHOULD BE ISOLATED FROM EACH OTHER.
SHIPMENT METHODS	HAWLEY. CONDENSED CHEM DICTNRY 9TH ED 883 CONTAINERS: DRUMS; TANK CARS; TANK TRUCKS. ... SHIPPING REGULATIONS: (RAIL, AIR) ORGANIC PHOSPHATE, LIQUID, NOS, POISON LABEL. NOT ACCEPTABLE ON PASSENGER PLANES.
POISONING POTENTIAL	HAWLEY. CONDENSED CHEM DICTNRY 9TH ED 883 HAZARD: MAY CAUSE NERVE DAMAGE BUT TO LESS

EXAMPLE 7: TDB (Continued)

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                          EXTENT THAN OTHER CHOLINESTERASE-INHIBITING
                          COMPD.
POISONING POTENTIAL       GOSSELIN. CTCP 4TH ED II-197 TOXICITY RATING:
                          3(?). 3= MODERATELY TOXIC: PROBABLE ORAL
                          LETHAL DOSE (HUMAN) 0.5-5 G/KG, BETWEEN 1 OZ
                          & 1 PINT (OR 1 LB) FOR 70 KG PERSON (150 LB).
POISONING POTENTIAL       GOSSELIN. CTCP 4TH ED II-197 SOME ETHYL
                          PHOSPHATE DERIVATIVES (EG, PARATHION) ARE
                          HIGHLY TOXIC CHOLINESTERASE INHIBITORS.
                          TRIETHYL PHOSPHATE IS THOUGHT TO BE WEAK
                          ENZYME INHIBITOR.
CONTINUE PRINTING? (YES/NO)

USER:
yes

PROG:

POISONING POTENTIAL       SAX. DANGER PROPS INDUS MATER 4TH ED 1196 SEE
                          PHOSPHATES. DISASTER HAZARD: DANGEROUS. WHEN
                          HEATED TO DECOMP, CAN EMIT HIGHLY TOXIC FUMES
                          OF PO(X). /PHOSPHATES/

SS 4 /C?
USER:
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EXAMPLE 8: TDB

```
file tdb

PROG:
YOU ARE NOW CONNECTED TO THE TOXICOLOGY DATA BANK FILE.

SS 1 /C?
USER:
all pesticide# (manf)

PROG:
SS (1) PSTG (348)

SS 2 /C?
USER:
inhalation (phtx)

PROG:
SS (2) PSTG (907)

SS 3 /C?
USER:
(ff) p

PROG:
SS (3) PSTG (177)

SS 4 /C?
USER:
1 and 2 and 3

PROG:
SS (4) PSTG (25)

SS 5 /C?
USER:
print 1 nm, abe, antr indented

PROG:

NAME OF SUBSTANCE          PHOSPHAMIDON
ABSORP/DISTRIB/EXCRETE     FOREIGN COMPD METAB IN MAMMALS VOL 1     287
                           THE MAIN ELIMINATIVE ROUTE FOR
                           PHOSPHAMIDON...IN RATS AND LACTATING GOATS
                           WAS VIA KIDNEYS, BUT SMALL AMT OF SEVERAL
                           METABOLITES WERE SECRETED INTO MILK OF
                           LACTATING GOATS. ONLY TRACES OF UNCHANGED
                           /PHOSPHAMIDON/ WERE PRESENT AMONGST EXCRETORY
                           PRODUCTS.
ABSORP/DISTRIB/EXCRETE     FOREIGN COMPD METAB IN MAMMALS VOL 1     287
                           DESETHYLPHOSPHAMIDON WAS PRESENT IN URINE OF
                           TREATED /RATS & LACTATING
                           GOATS/...WHEREAS...PHOSPHAMIDON AMIDE AND
                           DECHLOROPHOSPHAMIDON AMIDE OCCURRED IN URINE
                           AND MILK OF LACTATING GOATS.
                           ...ALPHA-CHLORO-NN-DIETHYLACETOACETAMIDE WAS
                           DETECTED IN URINE & IN MILK.
ABSORP/DISTRIB/EXCRETE     MENZIE. METAB PESTICIDES 1974     292 RATS
                           RECEIVED (32)P- AND/OR (14)C-LABELED
                           PHOSPHAMIDON BY STOMACH TUBE. URINE ANALYSIS
                           INDICATED PRESENCE OF... ...UNMETABOLIZED
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EXAMPLE 8: TDB (Continued)

	PHOSPHAMIDON...DES-N-ETHYL PHOSPHAMIDON, VINYL HYDROXYPHOSPHAMIDON, VINYL HYDROXY DES-N-ETHYL PHOSPHAMIDON, PHOSPHAMIDON AMIDE, N-HYDROXYETHYL PHOSPHAMIDON...
ABSORP/DISTRIB/EXCRETE	MENZIE. METAB PESTICIDES 1974 292 RATS RECEIVED (32)P- AND/OR (14)C-LABELED PHOSPHAMIDON BY STOMACH TUBE. URINE ANALYSIS INDICATED PRESENCE OF... ...N-HYDROXYETHYL DES-N-ETHYL PHOSPHAMIDON, VINYL HYDROXYPHOSPHAMIDON AMIDE AND TWO COMPOUNDS CONTAINING ONLY THE CARBON LABEL BUT NOT FURTHER IDENTIFIED.
ABSORP/DISTRIB/EXCRETE	MENZIE. METAB PESTICIDES 1969 276 AFTER IP INJECTION OF CIS OR TRANS PHOSPHAMIDON-(32)P INMALE WHITE RATS, EXCRETA WAS COLLECTED... ABOUT 60 % OF DOSE--EITHER ISOMER--WAS RECOVERED WITHIN 24 HR...MOST FROM URINE... ...PRODUCTS WERE DIMETHYL PHOSPHATE WITH SMALL AMT OF PHOSPHORIC ACID & O-DEMETHYL PHOSPHAMIDON.
ABSORP/DISTRIB/EXCRETE	MENZIE. METAB PESTICIDES 1969 276 IN /EXCRETA OF/ FIFTH-INSTAR TOBACCO BUDWORMS AND BOLLWORMS... ... .../PHOSPHAMIDON, O-DEMETHYLPHOSPHAMIDON, HYDROXYETHYL PHOSPHAMIDON, N-DESETHYL PHOSPHAMIDON, PHOSPHAMIDON ACID, DIMETHYL PHOSPHATE AND PHOSPHORIC ACID/ WERE DETECTED.
ABSORP/DISTRIB/EXCRETE	MARTIN. PESTICIDE MANUAL 4TH ED 409 PHOSPHAMIDON IS A SYSTEMIC INSECTICIDE RAPIDLY ABSORBED BY THE PLANT... ... THE HALF-LIFE IN PLANTS IS ABOUT 2 DAYS...
ANTIDOTE & TREATMENT	FARM CHEM HDBK 1975 D-71 ANTIDOTE: ATROPINE COMBINED WITH OXIME PREPARATIONS, EG PAM OR TONOGONIN.
ANTIDOTE & TREATMENT	GOSSELIN. CTCP 4TH ED II-190 SEE PARATHION. TREATMENT: 1. ATROPINIZE PATIENT IMMEDIATELY. IN ADULT USUAL DOSE...1 TO 4 MG OF SULFATE (OR OTHER SALT) GIVEN IM OR BETTER IV (IF THERE IS NO CYANOSIS). MAINTENANCE OF FULL ATROPINIZATION MAY REQUIRE 2 MG DOSES AT INTERVALS OF 15 TO 60 MIN FOR MANY HR. /PARATHION/
ANTIDOTE & TREATMENT	GOSSELIN. CTCP 4TH ED I-190 SEE PARATHION. TREATMENT: 1. /IF POSSIBLE, CORRECT CYANOSIS/ BEFORE ATROPINIZATION... 2. RELIEVE UPPER AIRWAY OBSTRUCTION... MUCUS & OTHER RESPIRATORY TRACT SECRETIONS MAY HAVE TO BE ASPIRATED CONTINUOUSLY. ENDOTRACHEAL INTUBATION OR TRACHEOTOMY MAY BECOME NECESSARY... /PARATHION/
ANTIDOTE & TREATMENT	GOSSELIN. CTCP 4TH ED II-190 SEE PARATHION. TREATMENT: 3. IN PRESENCE OF ESTABLISHED SYMPTOMS ADMINISTER PAM (2-PYRIDINE ALDOXIME METHOCHLORIDE, PRALIDOXIME CHLORIDE, PROTOPAM CHLORIDE). INITIAL ADULT DOSE...1 TO 2 G, PREFERABLY...IV INFUSION IN 100 ML SALINE OVER PERIOD...15 TO 30 MIN. /PARATHION/
ANTIDOTE & TREATMENT	GOSSELIN. CTCP 4TH ED II-190 SEE PARATHION. TREATMENT: 3. FOR MORE RAPID EFFECT /PAM/...CAN BE INJECTED IV AS 5 % SOLN IN WATER OVER PERIOD...NOT LESS THAN 5 MIN. IN CHILDREN INITIAL DOSE...20 TO 40 MG/KG. IF WEAKNESS PERSISTS...SECOND DOSE OF 1 TO 2 G MAY BE ADMIN AFTER 1 HR, AS INDICATED. /PARATHION/
ANTIDOTE & TREATMENT	GOSSELIN. CTCP 4TH ED II-190 SEE PARATHION. TREATMENT: 4. OXYGEN & ARTIFICIAL

EXAMPLE 8: TDB (Continued)

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                                TREATMENT: 4. GIVE OXYGEN & ARTIFICIAL
                                RESPIRATION AS NEEDED... PULMONARY EDEMA MAY
                                OCCUR... 5. GASTRIC LAVAGE WITH 5 % SODIUM
                                BICARBONATE SOLN MAY BE WARRANTED AFTER
                                INGESTION OF PARATHION, IF SPONTANEOUS
                                VOMITING IS NOT PROMPT & PROFUSE. /PARATHION/
ANTIDOTE & TREATMENT            GOSSELIN. CTCP 4TH ED  II-190 SEE PARATHION.
                                TREATMENT: 6. WASH ANY CONTAMINATED AREASOF
                                SKIN WITH SOAP & WATER OR...WITH 95 % ETHYL
                                ALCOHOL... IRRIGATEEYES WITH WATER OR SALINE
                                SOLN. 7. /ADMIN IV/ ISOTONIC SALINE TO
                                CORRECT DEHYDRATION & ELECTROLYTE IMBALANCES.
                                GIVE SODIUM BICARBONATE FOR METAB ACIDOSIS.
                                /PARATHION/
CONTINUE PRINTING? (YES/NO)

USER:
yes

PROG:

ANTIDOTE & TREATMENT            GOSSELIN. CTCP 4TH ED  II-190 SEE PARATHION.
                                TREATMENT: 8. NEVER GIVE THEOPHYLLINE,
                                ORTHEOPHYLLINE-ETHYLENEDIAMINE
                                (AMINOPHYLLINE). AVOID CENTRAL DEPRESSANT
                                DRUGS SUCH AS MORPHINE, BARBITURATES
                                /INCLUDING SHORT-ACTING ONES/, RESERPINE,
                                PHENOTHIAZINES AND OTHER TRANQUILIZERS...
                                /PARATHION/
ANTIDOTE & TREATMENT            GOSSELIN. CTCP 4TH ED  II-190 SEE PARATHION.
                                TREATMENT: 9. KEEP PATIENT UNDER
                                CONSTANTOBSERVATION FOR A PERIOD OF 24 TO 36
                                HR. SYMPTOMS MAY PERSIST FOR A MONTH...
                                LABORATORY /DIAGNOSIS/: 1. REPEATED BLOOD
                                ANALYSES FOR CHOLINESTERASE ACTIVITY...
                                TISSUE LEVELS OF ORGANOPHOSPHATES... 2.
                                ECG... /PARATHION/
ANTIDOTE & TREATMENT            GOSSELIN. CTCP 4TH ED  II-190 SEE PARATHION.
                                LABORATORY /DIAGNOSIS/: 3. SEVERE
                                HYPOGLYCEMIA OCCURRED IN FATALLY POISONED
                                CHILD. ...PARATHION...PRODUCES DECREASES IN
                                BLOOD GLUCOSE LEVELS IN MICE, APPARENTLY BY
                                DIRECT STIMULATION OF ISLET SECRETION...
                                /PARATHION/

SS 5 /C?
USER:
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